DRAFT DATE: 25 MAR 2004

NAD

SERVICE MANUAL

T 163

AV Tuner Preamplifier

T 163

AV Tuner Preamplifier

SAFETY INFORMATION

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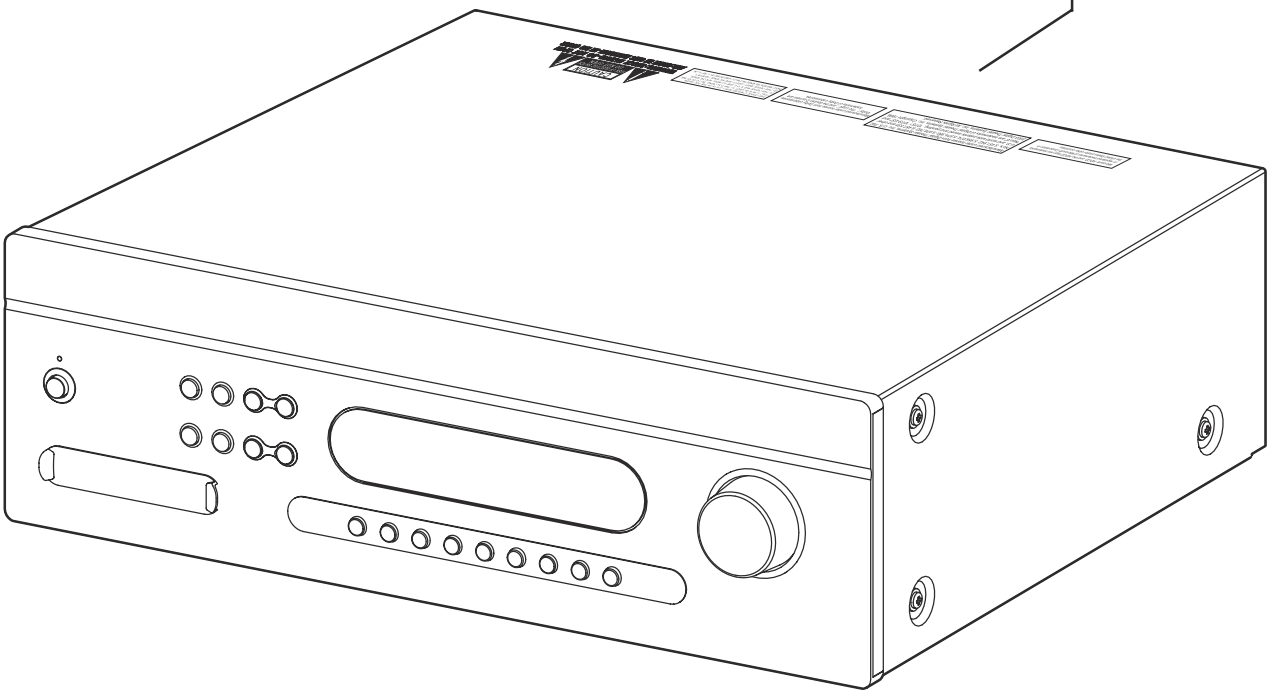
THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS: (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE, (2) THIS DEVICE MUST ACCEPT INTERFERENCE RECEIVED, INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATION.

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

WARNING: SHOCK HAZARD - DO NOT OPEN
AVIS: RISQUE DE CHOC ELECTRIQUE - NE PAS OUVRIR



SERVICE SAFETY PRECAUTIONS

1. Replacing the fuses

CAUTION:
FOR CONTINUED PROTECTION AGAINST THE RISK OF FIRE REPLACE ONLY WITH SAME TYPE OF FUSE.

Reference Designator	Part Number	Description
F751 ⚠	33-0151009-00-88	FUSE 500mA 250VAC TIME-LAG 5X20mm 5T UL/CSA/VDE/SEMKO
F752 ⚠	33-0111009-00-88	FUSE 1A 250VAC TIME-LAG 5X20mm 5T UL/CSA/VDE/SEMKO

2. Safety check out

(Only U.S.A. model)

Before returning the product to the customer, make leakage current or resistance measurements to determine that exposed parts are acceptably insulated from supply circuit.

Parts marked with the symbol ⚠ are critical with regard to the risk of fire and electric shock. Replace only with parts recommended by the manufacturer.

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SPECIFICATIONS

PRE AMPLIFIER SECTION

Rated distortion	(2 V@Pre-out, THD 20 Hz-20 kHz FL/C/FR)	≤ **0.1 %**
	(2 V@Pre-out, THD 20 Hz-20 kHz SL/SR/BS)	≤ **0.1 %**
Input Sensitivity	(2 V@Pre-out, 1 kHz)	**520 ± 20 mV**
S/N Ratio	(A-wtd, 1kHz, 1 W, 2 V@Pre-out, FL/C/FR/SL/SR/BL)	**≥ 80 dB**
Frequency Response	(20 Hz - 20 kHz)	**0 ± 1.0 dB**
Channel Balance	(1 dB to -40 dB, 1 kHz)	≤ **2 dB**
	(-41 dB to -50 dB, 1 kHz)	≤ **3 dB**
Audio muting at 1 kHz		**≥ 55 dB**
Subwoofer out, 500 mV in	(THD at 2 V O/P, 100 Hz)	≤ **0.5 %**
Crosstalk	(500 mV input, 1 V@Pre-out)	**≥ 60 dB**

Controls

Bass	(at 500 mV in, 1 W out, 100 Hz)	**± 10 dB ± 2 dB**
Treble	(at 500 mV in, 1 W out, 10 kHz)	**± 10 dB ± 2 dB**

DOLBY DIGITAL SECTION

Channel Difference (FL ref. Track 30)			**± 1.2 dB**
Frequency Resporse at Dolby config.2		SL Track 46 200 - 20 kHz	**± 0.8 dB**
		SR Track 47 200 - 20 kHz	**± 0.8 dB**
		C Track 44 200 - 20 kHz	**± 0.8 dB**
Harmonic Distortion (2 V@Pre-out, Audio LPF, Dolby Congfig 1)		FL Track 65 997 Hz	≤ **0.08 %**
		FR Track 67 997 Hz	≤ **0.08 %**
		SL Track 68 997 Hz	≤ **0.08 %**
		SR Track 69 997 Hz	≤ **0.08 %**
		C Track 66 997 Hz	≤ **0.08 %**
S/N Ratio	(TRACK 30 for O/P 1 W, PAUSE)	CCIR / ARM	**≥ 65 dB**
		Audio LPF	**≥ 70 dB**
		A-WTD	**≥ 70 dB**

DOLBY PRO LOGIC II SECTION

Frequency Resporse

I/P mode : L, R	: 1 V in, 1 W, Ch L/R	40 Hz	**0 ± 2.0 dB**
		20 kHz	**0 ± 2.0 dB**
I/P mode : L=R	: 1 V in, 1 W, Ch /L/R	40 Hz	**0 ± 2.0 dB**
	Ch C	20 kHz	**0 ± 2.0 dB**
I/P mode : L=-R	: 1 V in, 1 W, Ch SL/SR	40 Hz	**0 ± 2.0 dB**
		20 kHz	**0 ± 2.0 dB**

S/N Ratio (200 mV in, 1 W, A-WTD w/ 1 k termination)		
I/P mode : L, R	: 1 kHz, Ch L/R	**≥ 65 dB**
I/P mode : L=R	: 1 kHz, Ch C	**≥ 65 dB**
I/P mode : L=-R	: 1 kHz, Ch SL/SR	**≥ 65 dB**
THD (2.2 V in, 1 W, w/ 80 kHz LPF, 1 kHz)		≤ **0.2 %**

DTS SECTION

Output Level (Vol 0 dB)	: FL/FR/C/SL/SR	Track 6 1 kHz	**90 ± 10 mV**
Channel Difference (FL ref)	: FL/FR/C/SL/SR	Track 6 1 kHz	**± 1.0 dB**
Harmonic Distortion (Audio Filter)	: FL/FR/C/SL/SR	Track 10-14 1 kHz	**≤ 0.08 %**
Frequency Response (20 Hz to 20 kHz)		Track 26-30	**+2/-1.5**
Subwoofer Output Level	1 kHz ref at pre-out (FL)	Play Track 10, charge to 15	**12.5 ± 1.5 dB**

AM TUNER SECTION

Input level is expressed as the reading in open circuit of 75-ohm source impedance signal generator

Usable sensitivity	(999/1000 kHz)	**≤ 30 dBuV**
S/N Ratio	(5 mV in)	**≥ 38 dB**
THD	(5 mV in)	**≤ 3 %**
IF Rejection	(450 kHz)	**≥ 36 dB**
Image Rejection	(F+2xIF)	**≥ 28 dB**
Selectivity		**≥ 17 dB**
Output		**200 ± 20 mV**
Loop sensitivity	(20 dB S/N)	
	999/1000 kHz	**≤ 66 dB**
	603/600 kHz	**≤ 66 dB**
	1404/1400 kHz	**≤ 66 dB**
Frequency Response	(100 - 2.3 kHz, 5 mV)	**± 6 dB**

FM TUNER SECTION

Input level is expressed as the reading in open circuit of 75-ohm source impedance signal generator

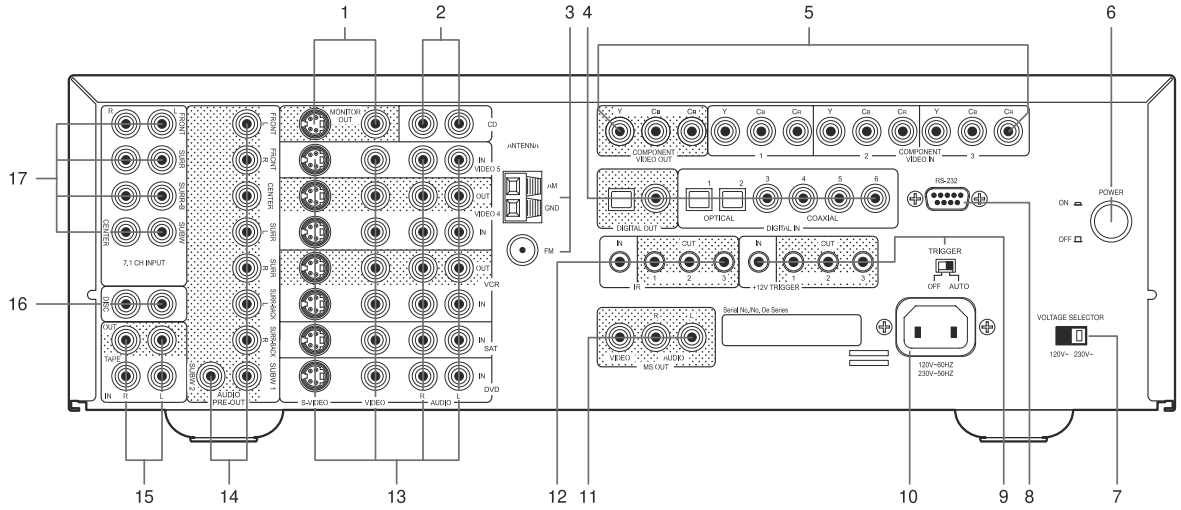
			*C	*AH
Usable sensitivity	(98 MHz)		**≤ 15 dBµV**	**≤ 15 dBuv**
S/N Ratio	(60 dB, IHF wtd)	Mono	**≥ 63 dB**	**≥ 63 dB**
		Stereo	**≥ 63 dB**	**≥ 63 dB**
Frequency Response	(20 Hz - 15 kHz, 60 dBµ)		**0 ± 1.5 dB**	**0 ± 1.5 dB**
Channel Separation	(60 dBµ)	100 Hz	**≥ 30 dB**	**≥ 30 dB**
		1 k	**≥ 38 dB**	**≥ 38 dB**
		10 kHz	**≥ 30 dB**	**≥ 30 dB**
Alternate Channel Selectivity (40 dBµ, ± 400 kHz)			**≥ 60 dB**	**≥ 45 dB**
Capture Ratio	(40 dBµ)		**≤ 3 dB**	**≤ 3 dB**
AM Suppression (60 dBµ, 100% Mod. FM, 30% Mod. AM)			**≥ 48 dB**	**≥ 48 dB**
Image Rejection	(119.4 MHz)		**–**	**≥ 65 dB**
I.F. Rejection	(10.7 MHz)		**≥ 78 dB**	**–**
Pilot Suppression	(98 MHz)		**≥ 60 dB**	**≥ 60 dB**
THD (60 dBµ, L=R 75 kHz for AH, 40 kHz Dev for C)		Mono	**≤ 0.25 %**	**≤ 0.25 %**
		Stereo	**≤ 0.35 %**	**≤ 0.35 %**
Auto-Search Sensitivity		On	**≥ 24 dBµ**	**≥ 24 dBµ**
		Off	**≤ 15 dBµ**	**≤ 15 dBµ**
RDS decode Sensitivity			**≤ 26 dBµ**	**–**

PHYSICAL SPECIFICATIONS

Dimensions (Width x Height x Depth)	**435 x 150 x 399 mm**
Net Weight	**8 Kg (17.60 lbs)**
Shipping Weight	**10.2 Kg (22.40 lbs)**

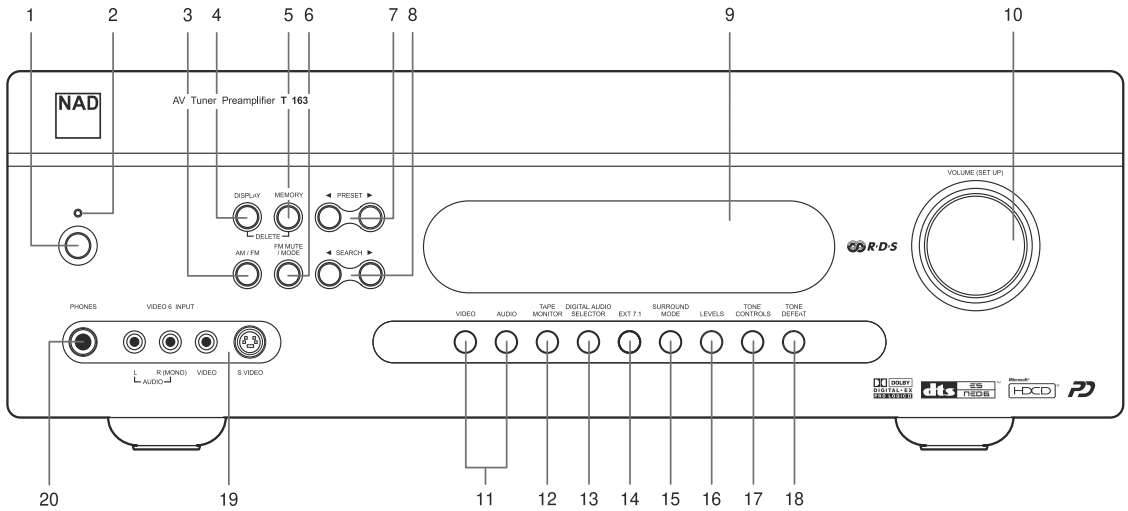
REAR PANEL / FRONT PANEL VIEW

REAR PANEL



1. MONITOR OUT
2. CD INPUT
3. FM & AM ANTENNA
4. DIGITAL AUDIO INPUT & DIGITAL AUDIO OUTPUT
5. COMPONENT VIDEO IN & COMPONENT VIDEO OUT
6. POWER SWITCH
7. 120V / 230V VOLTAGE SELECTOR
8. RS-232
9. AUTO TRIGGER SWITCH
10. AC POWER INLET
11. MS OUT (MULTISOURCE OUT)
12. IR INPUT & OUTPUT
13. DVD, SAT, VCR, VIDEO 4 & VIDEO 5
14. PRE-OUTS / SUBWOOFER OUT
15. TAPE INPUT & OUTPUT
16. DISC INPUT
17. 7.1 CH. INPUTS

FRONT PANEL



1. STANDBY SWITCH
2. STANDBY LED
3. AM / FM
4. DISPLAY
5. MEMORY
6. FM MUTE / MODE
7. PRESET DOWN / UP
8. SEARCH DOWN / UP
9. VFL DISPLAY
10. VOLUME (SETUP)
11. VIDEO & AUDIO
12. TAPE MONITOR
13. DIGITAL AUDIO SELECTOR
14. EXT. 7.1
15. SURROUND MODE
16. LEVELS
17. TONE CONTROLS
18. TONE DEFEAT
19. VIDEO 6 INPUT
20. PHONES

DISASSEMBLY INSTRUCTIONS

1. Remove machine screws M4.0 x 8.0 (**1** to **6**) from the side panels.
Remove tapping screw 3.0 x 8.0 (**7** to **10**) from the back panel.
Refer to **Figure No. 1**.

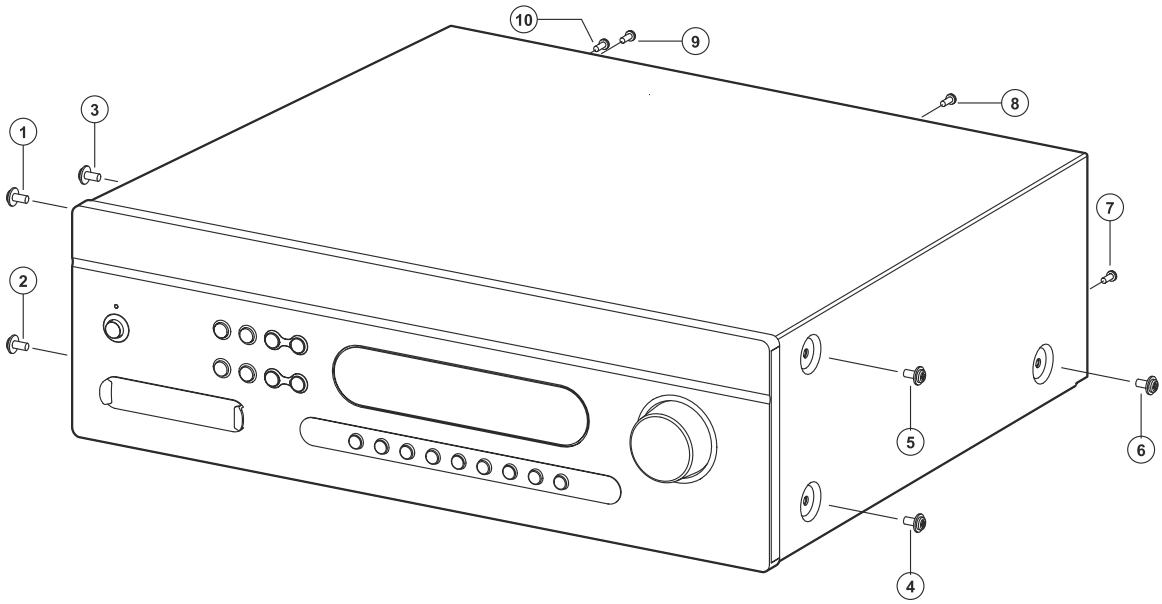


Figure No. 1

2. Pull both sides of the TOP COVER slightly outwards **11** and tilt approx. 35 ° and then remove in the direction as indicated by the arrow **12**. Refer to **Figure No. 2**.

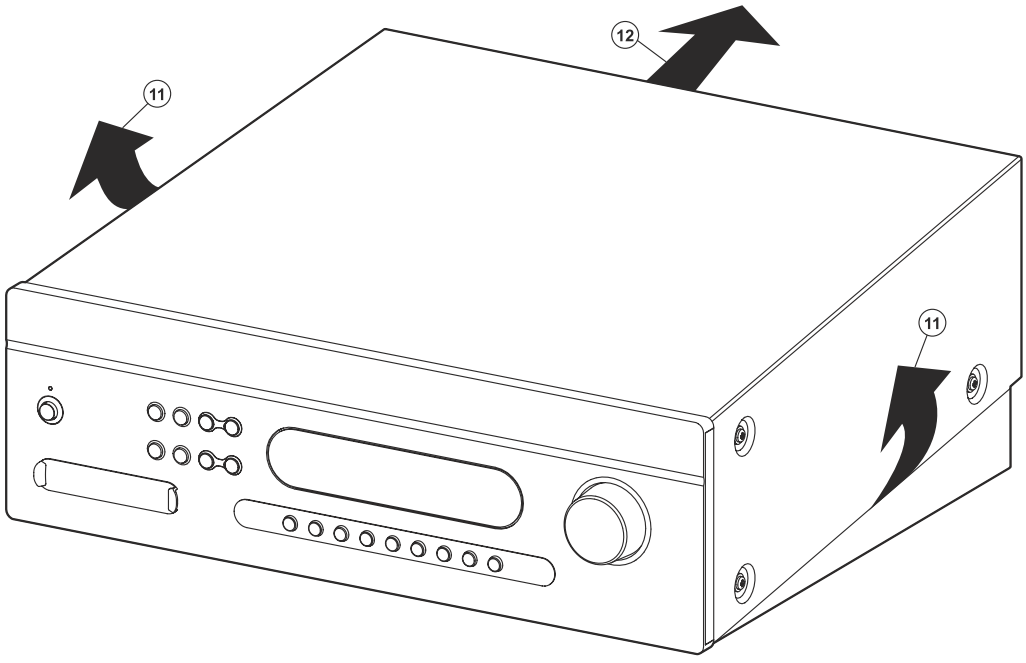
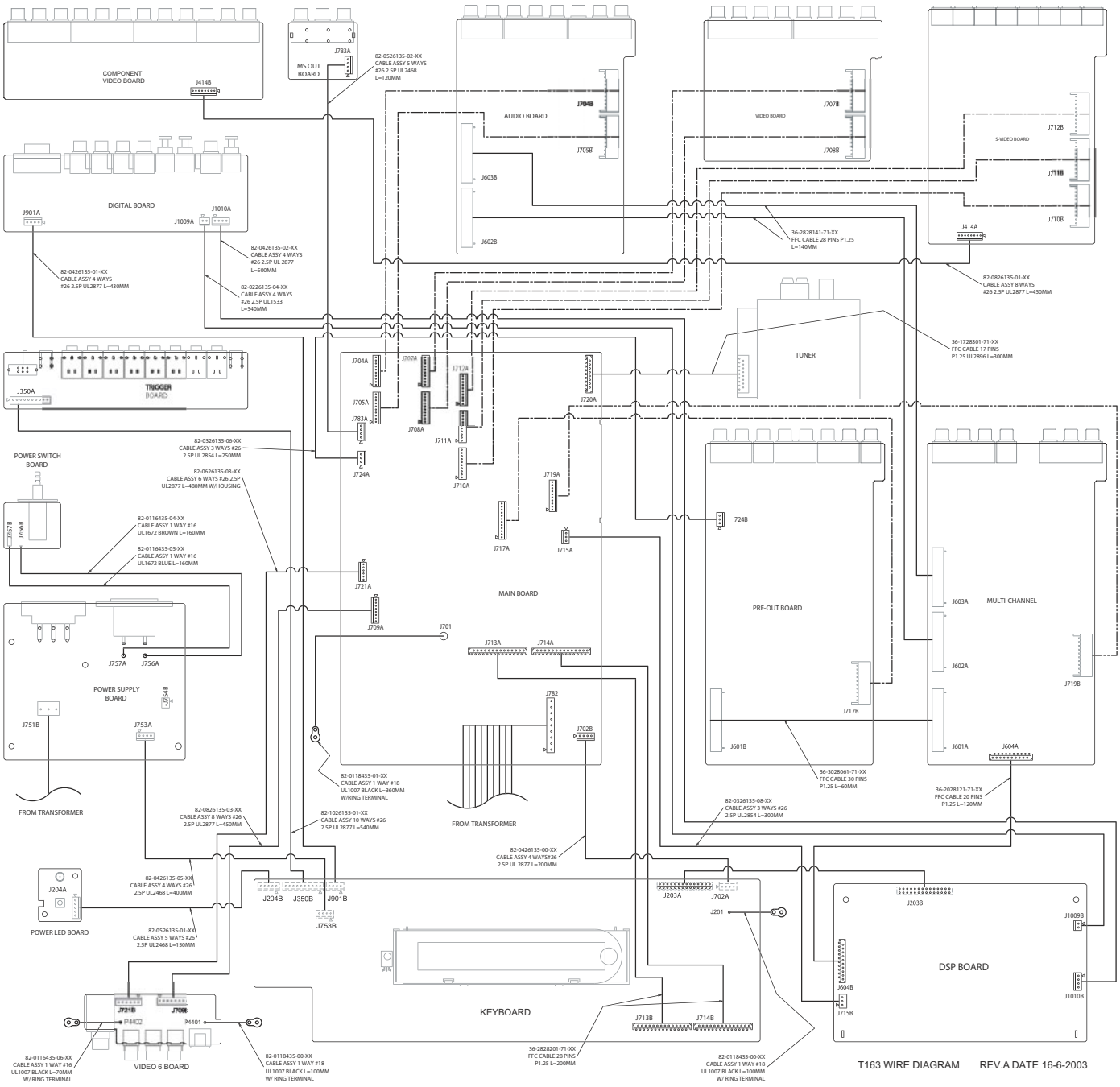
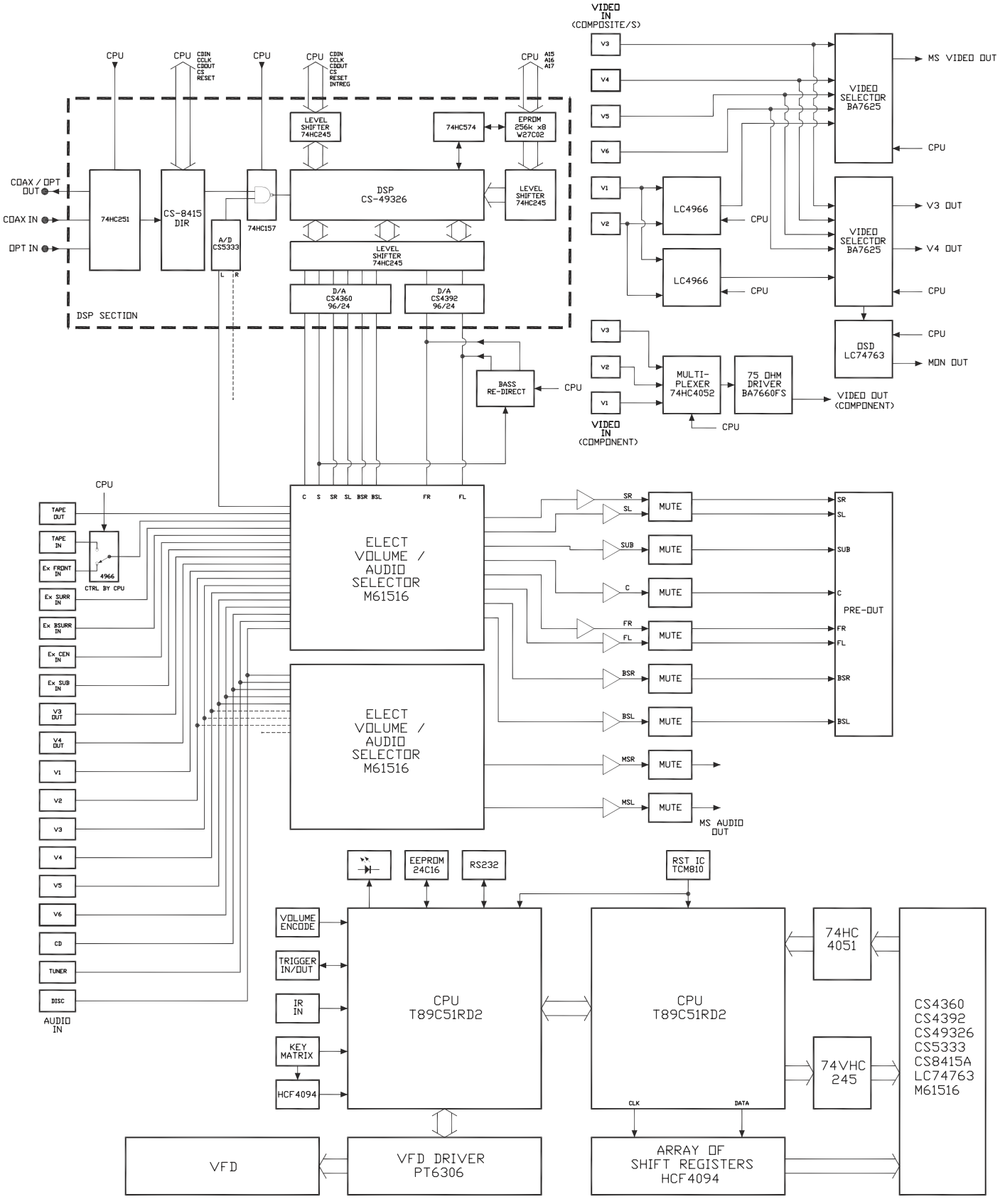


Figure No. 2

WIRING DIAGRAM



BLOCK DIAGRAM



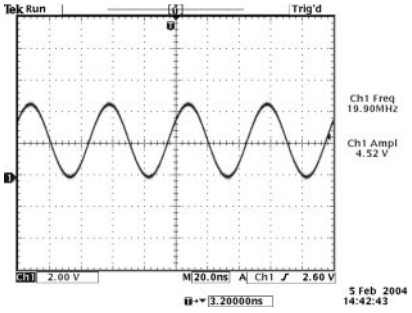
T163 Block Diagram
Issue : 01

SPECIAL FUNCTION

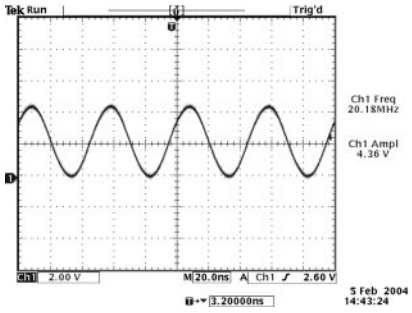
FEATURE	KEYS PRESS ON FRONT PANEL
RESET FOR AH VERSION	VIDEO + TONE DEFEAT
RESET FOR C VERSION	VIDEO + TONE CONTROLS
NTSC / PAL SELECTION	VIDEO + MEMORY
VFD ALL DISPLAY	AUDIO + TAPE MONITOR
AM FREQ. STEP	AM/FM + FM MUTE

DETAILS & WAVEFORMS ON SYSTEM TEST & DEBUGGING

T89C51RD2 (U202) main clock is at 20MHz (X202)

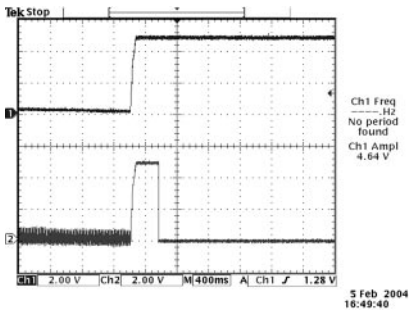


T89C51RD2 (U201) main clock is at 20MHz (X201)



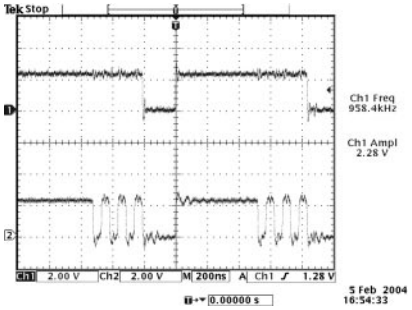
UPPER - +5V supply to KEYBOARD when power up

LOWER - RESET line (TCM810LENB713) when power up

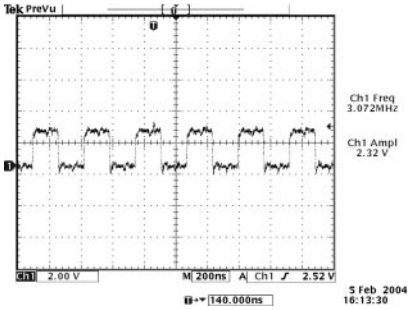


UPPER - OUTPUT ENABLE (pin 24) of EPROM (W27C02) when changing SURROUND MODES

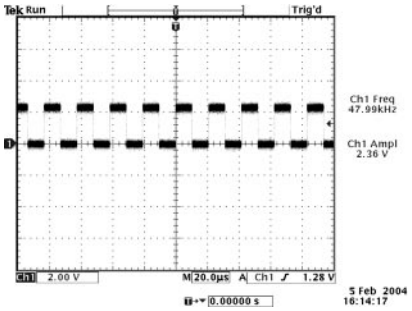
LOWER - CHIP ENABLE (pin 22) of EPROM (W27C02) when changing SURROUND MODES



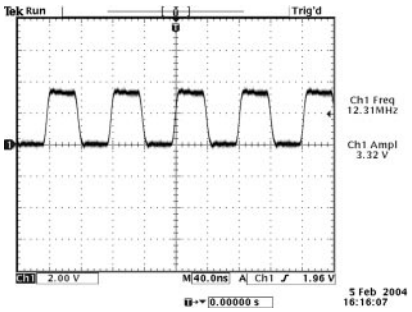
SCLK (pin 43 of CS49326)



LRCLK (pin 42 of CS49326)



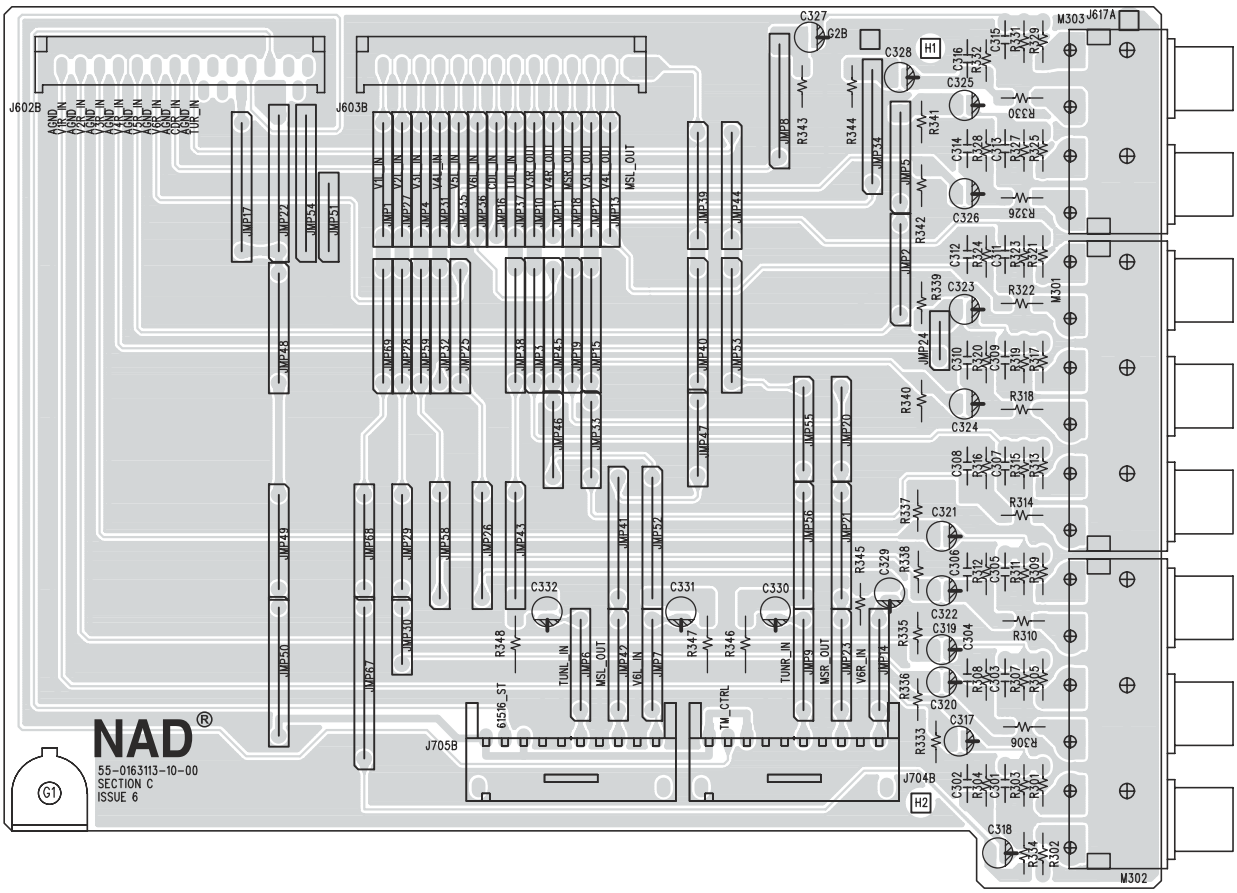
MCLK (pin 30 of CS49326)



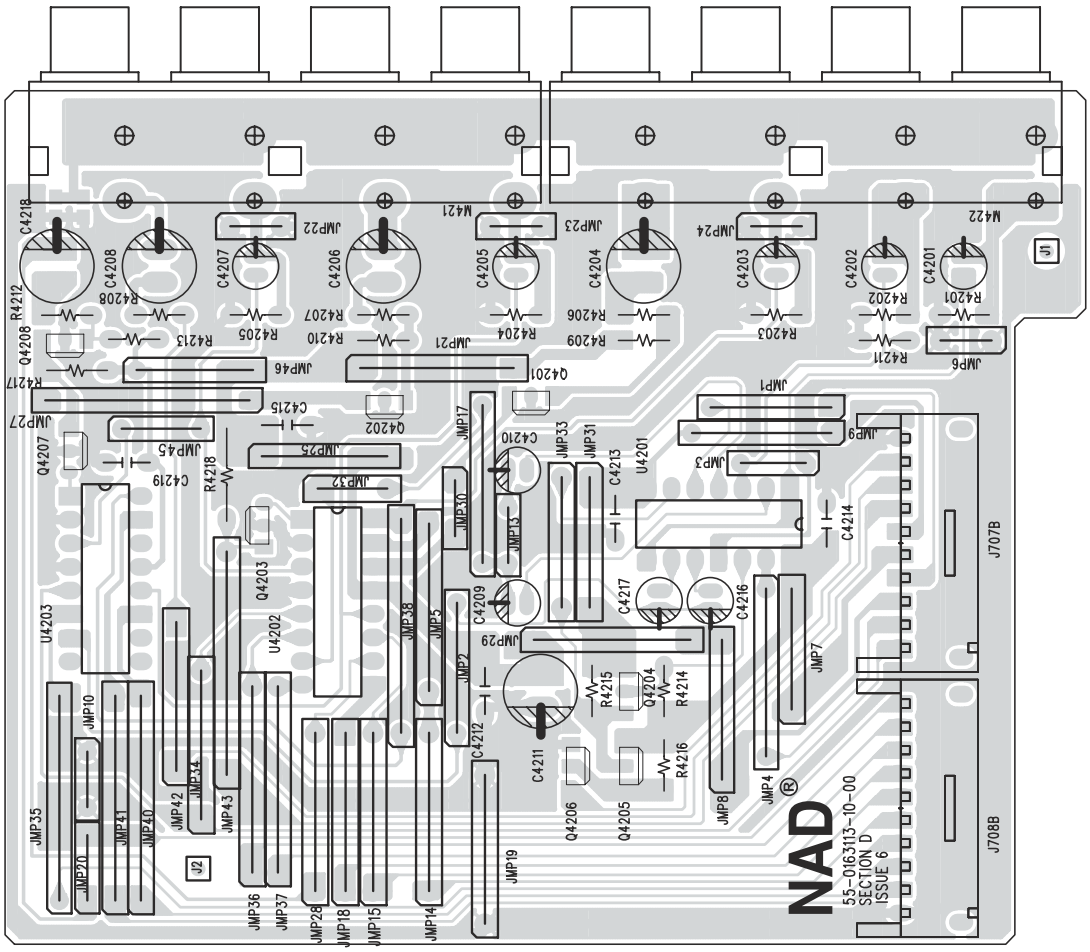
NOTE: The waveforms are based on software version V1.26.

PCB LAYOUT

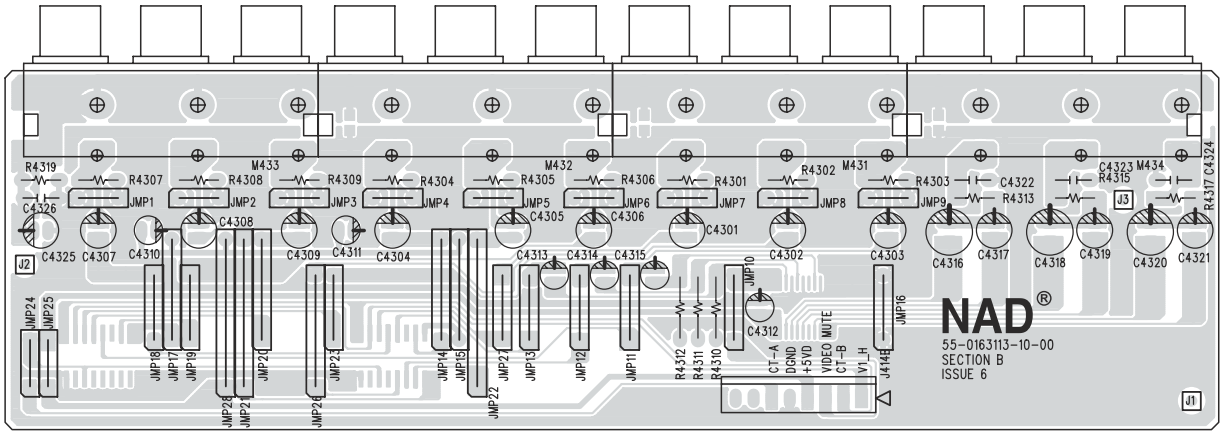
AUDIO BOARD



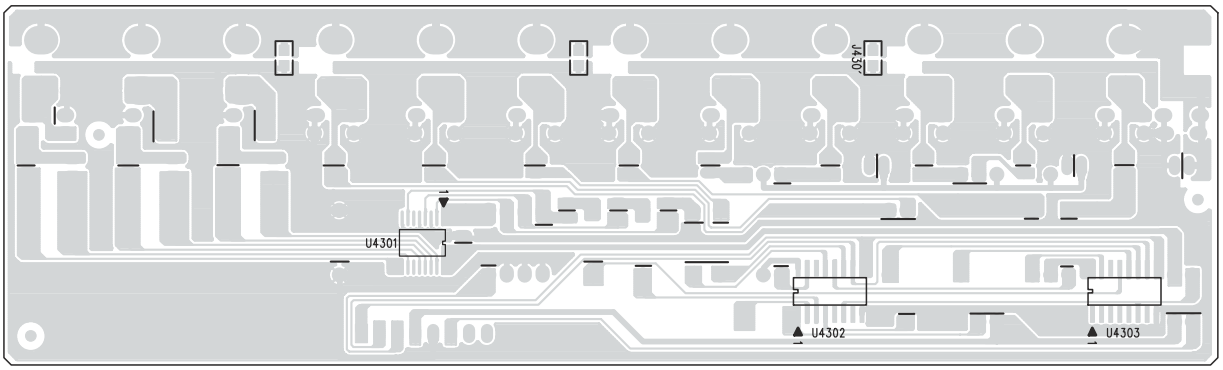
COMPOSITE VIDEO BOARD



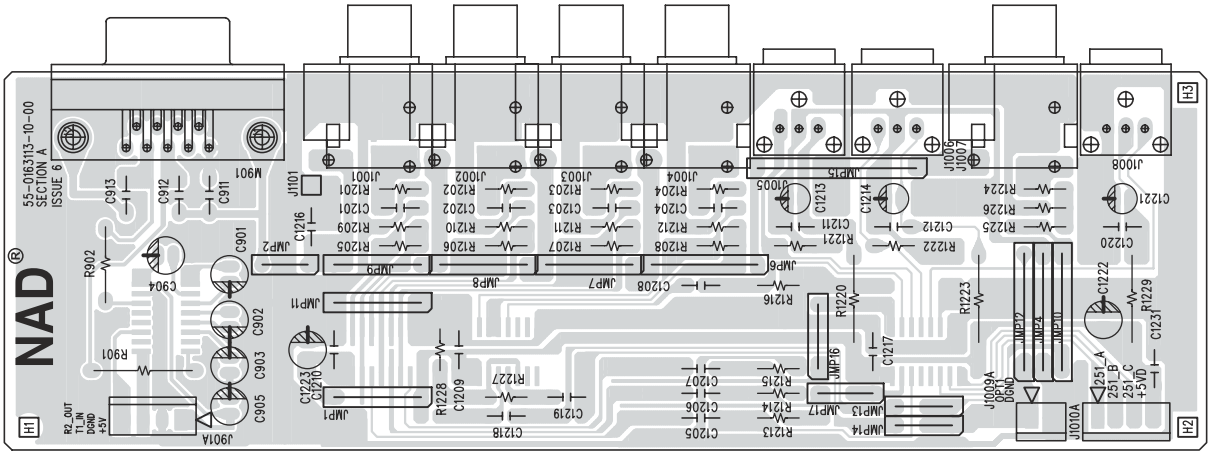
COMPONENT VIDEO BOARD - COMPONENT SIDE



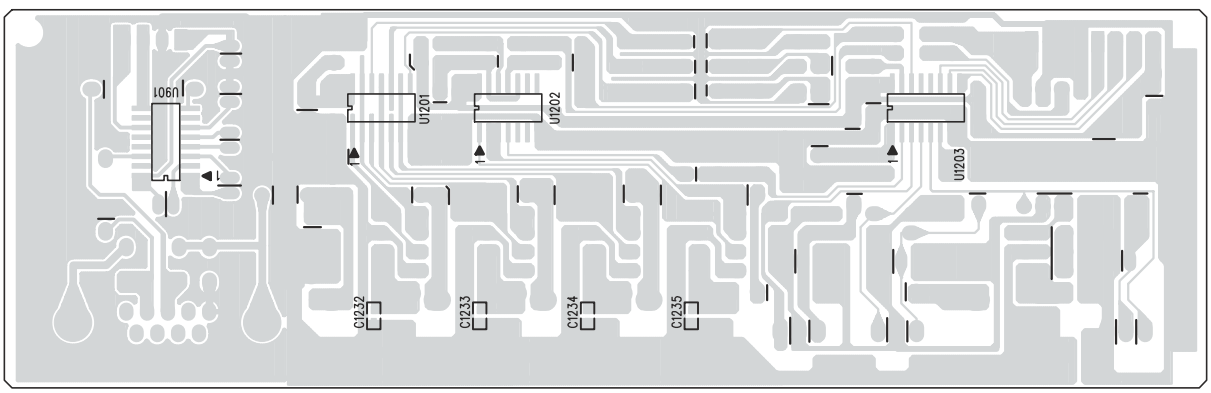
COMPONENT VIDEO BOARD - COPPER SIDE



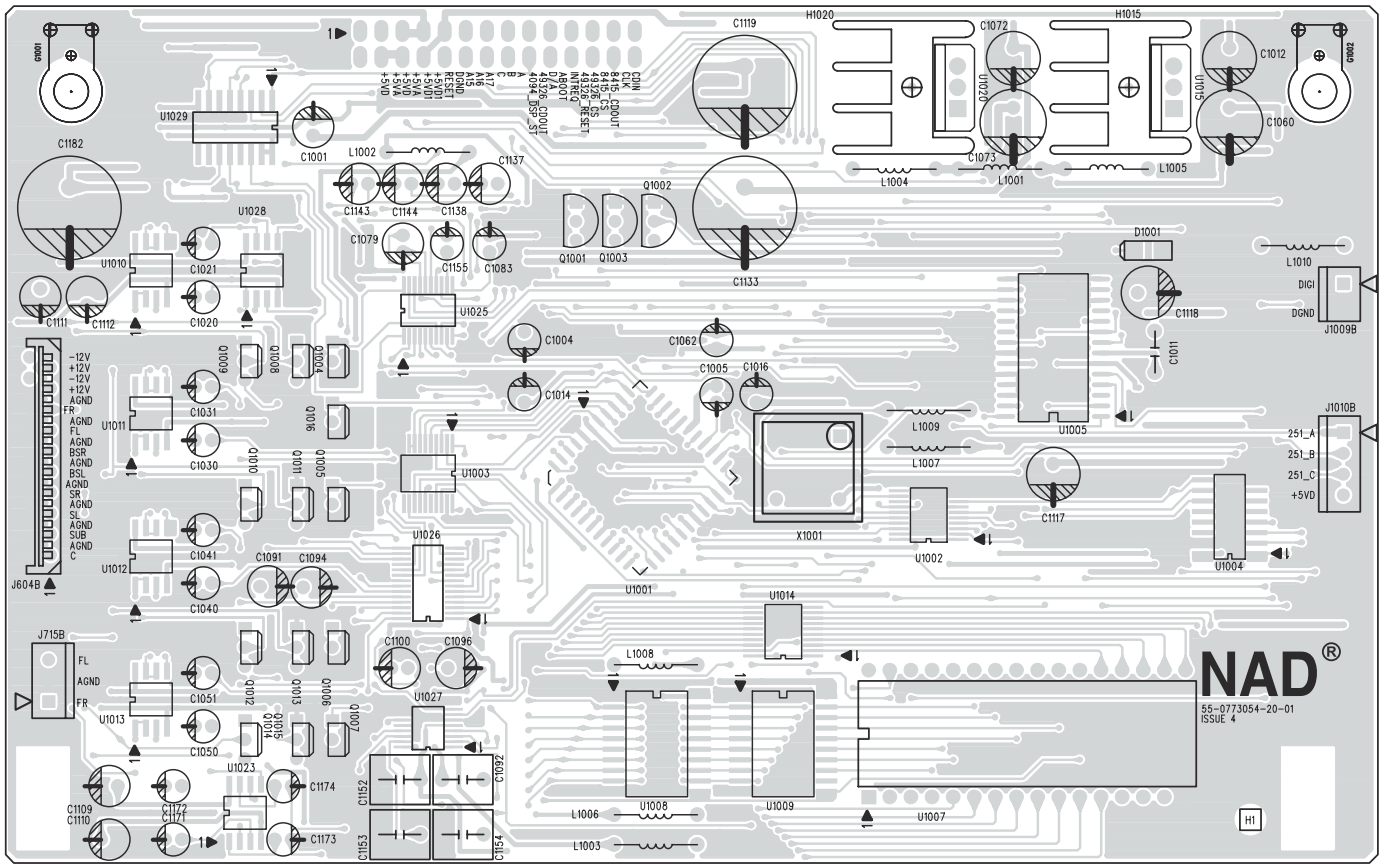
DIGITAL BOARD - COMPONENT SIDE



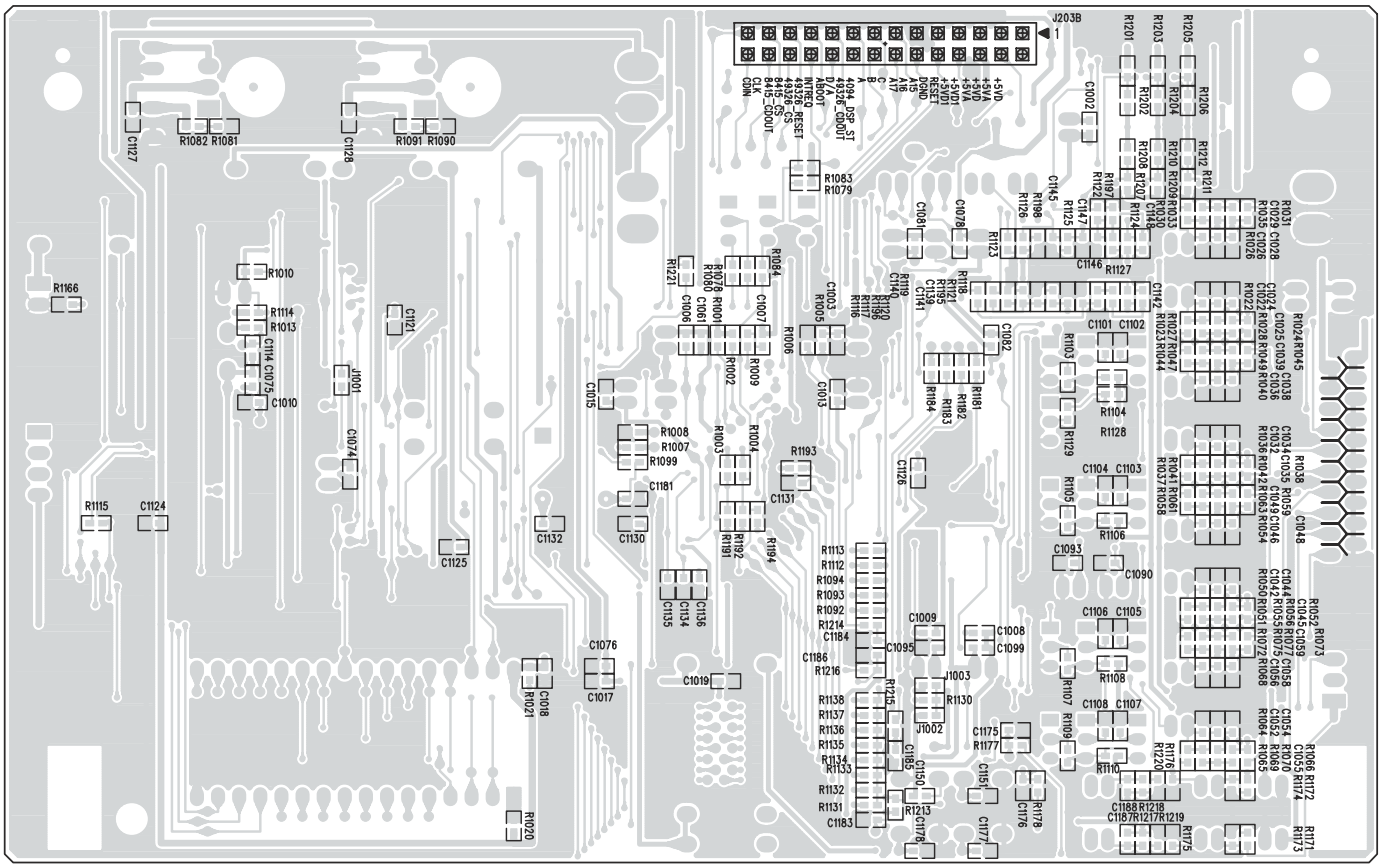
DIGITAL BOARD - COPPER SIDE



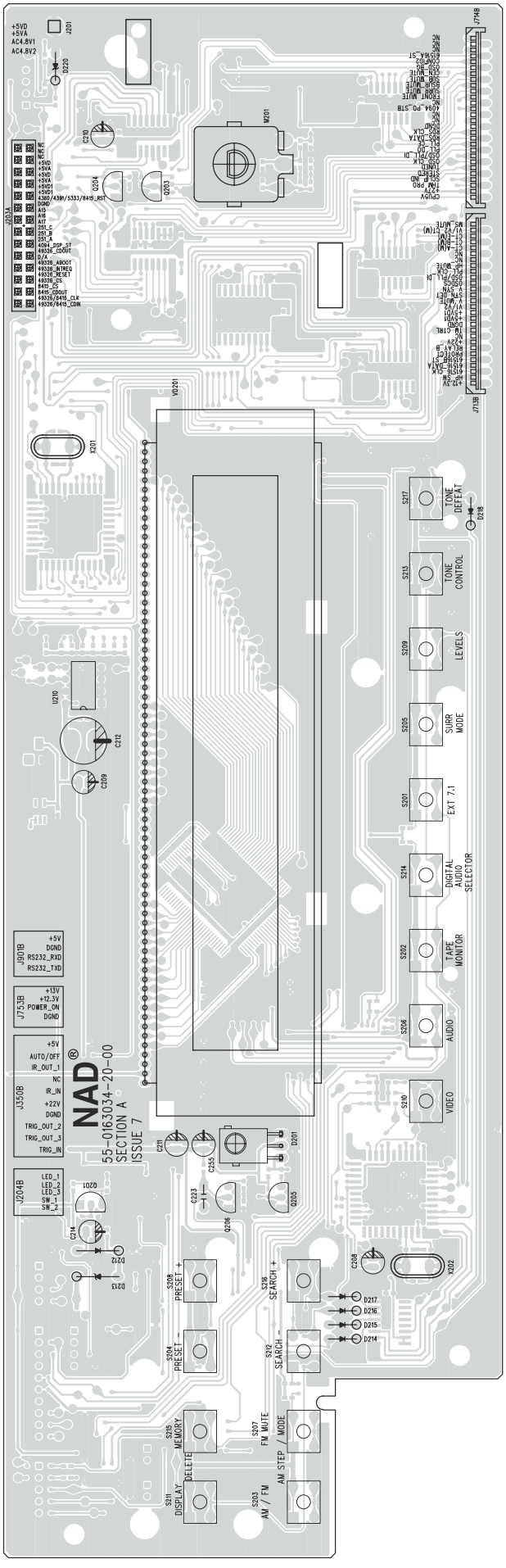
DSP BOARD - COMPONENT SIDE



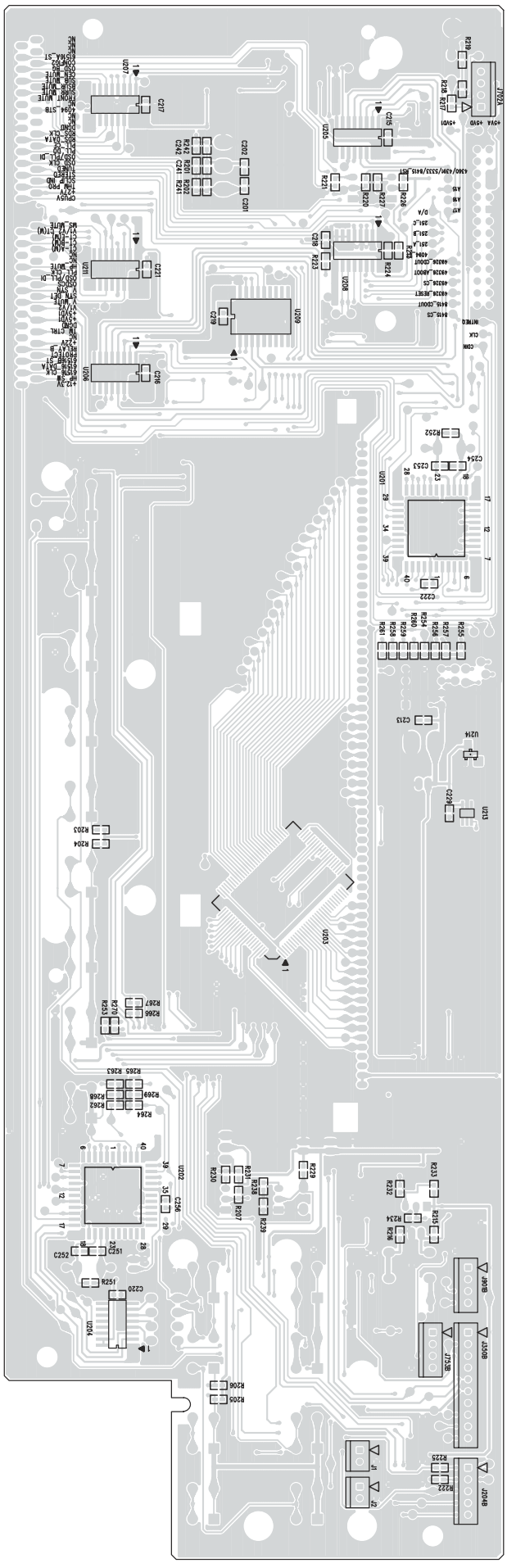
DSP BOARD - COPPER SIDE



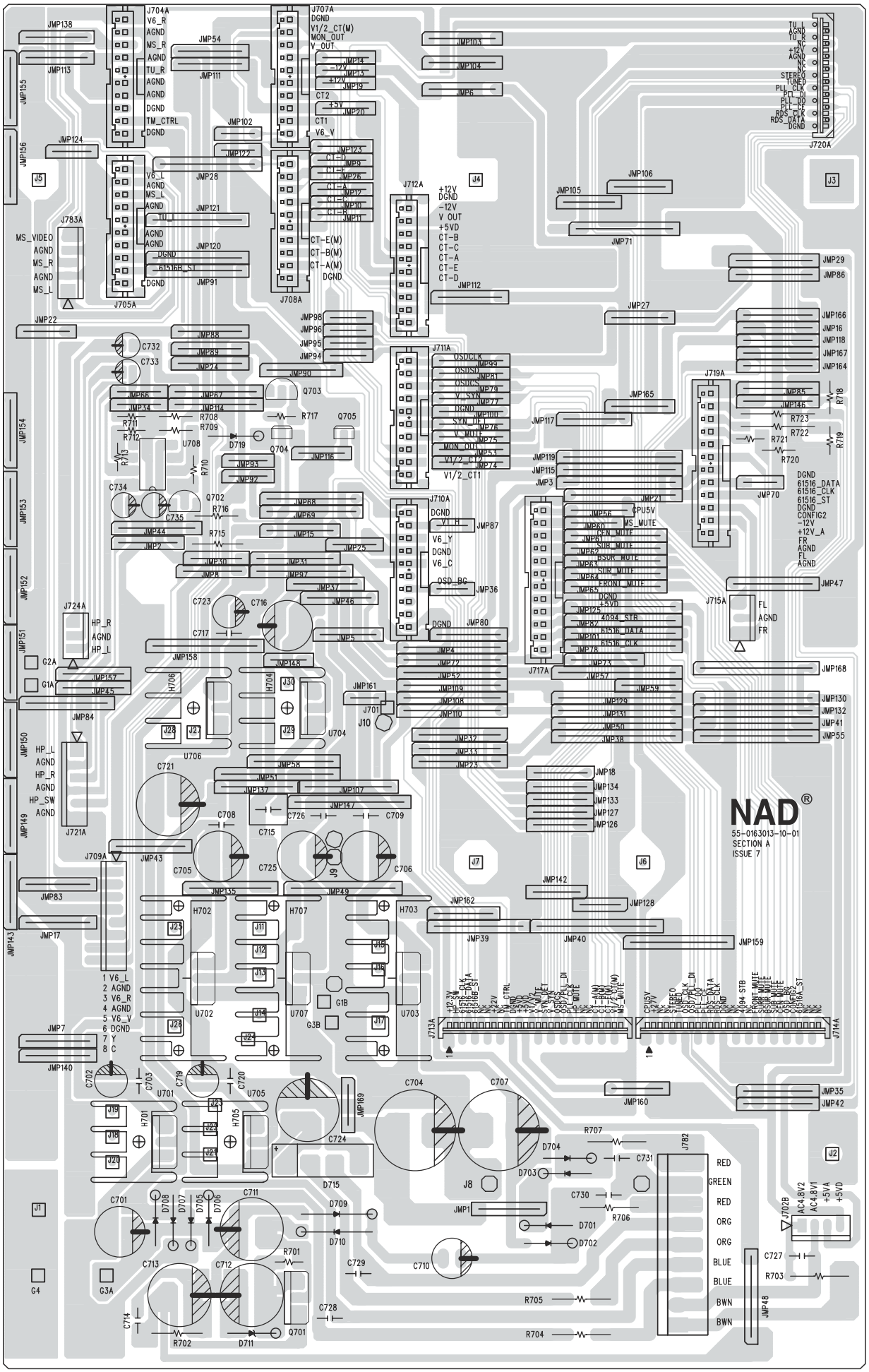
KEY BOARD / LED BOARD - COMPONENT SIDE



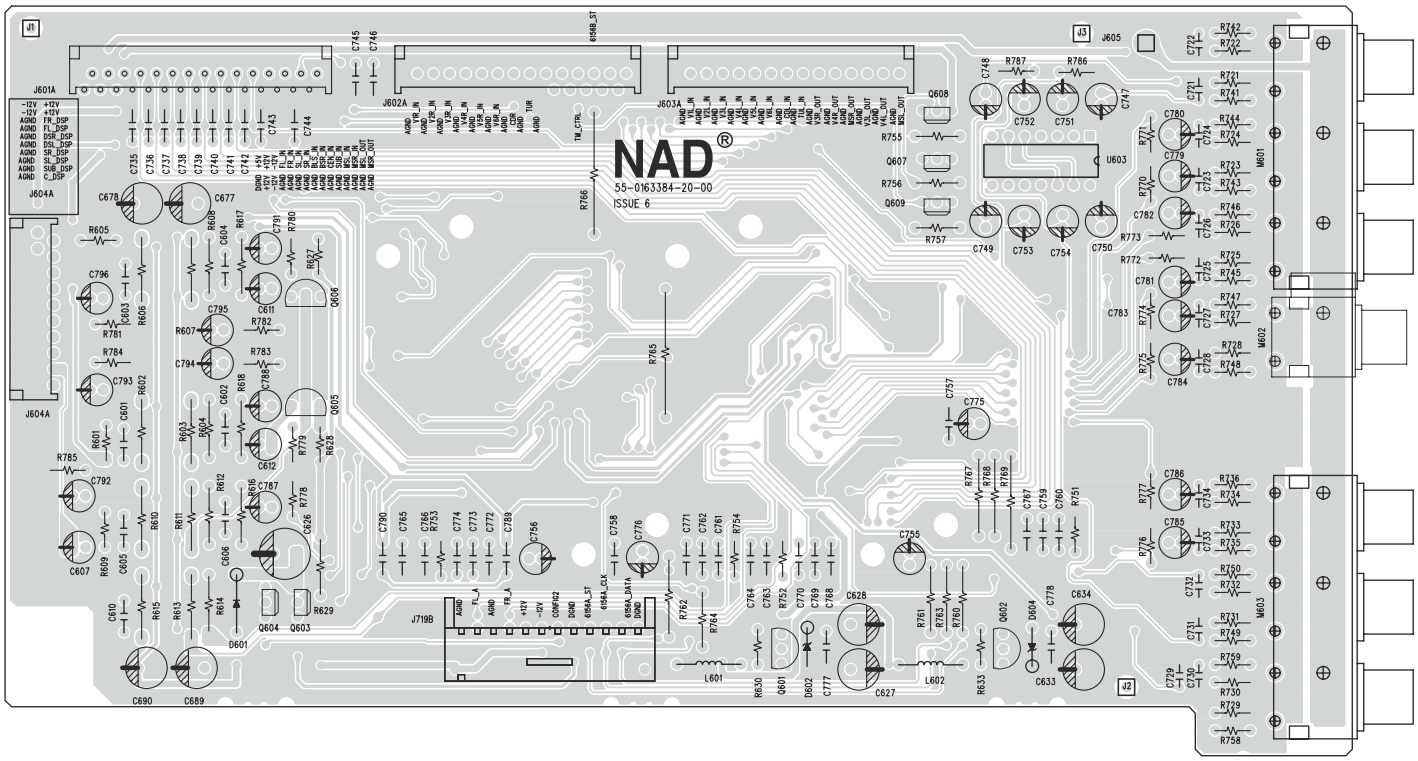
KEY BOARD / LED BOARD - COPPER SIDE



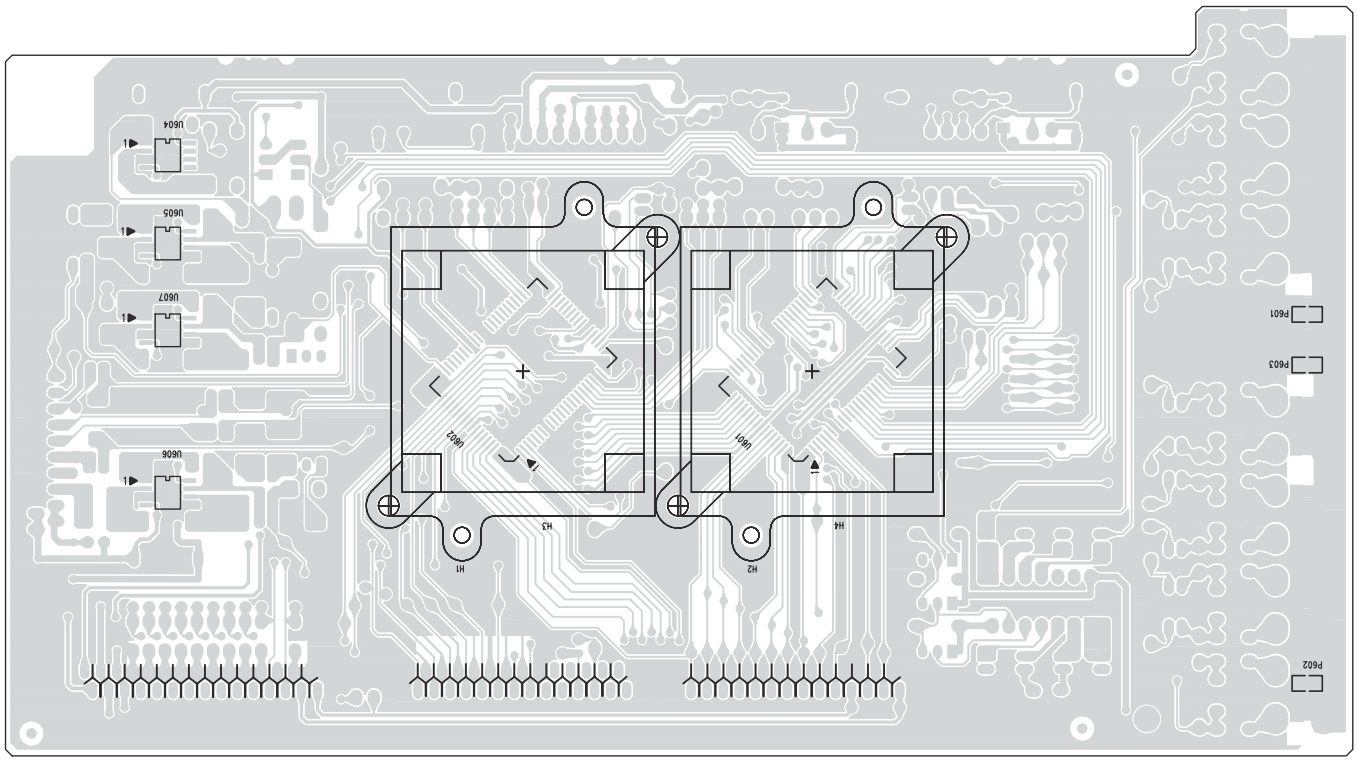
MAIN BOARD



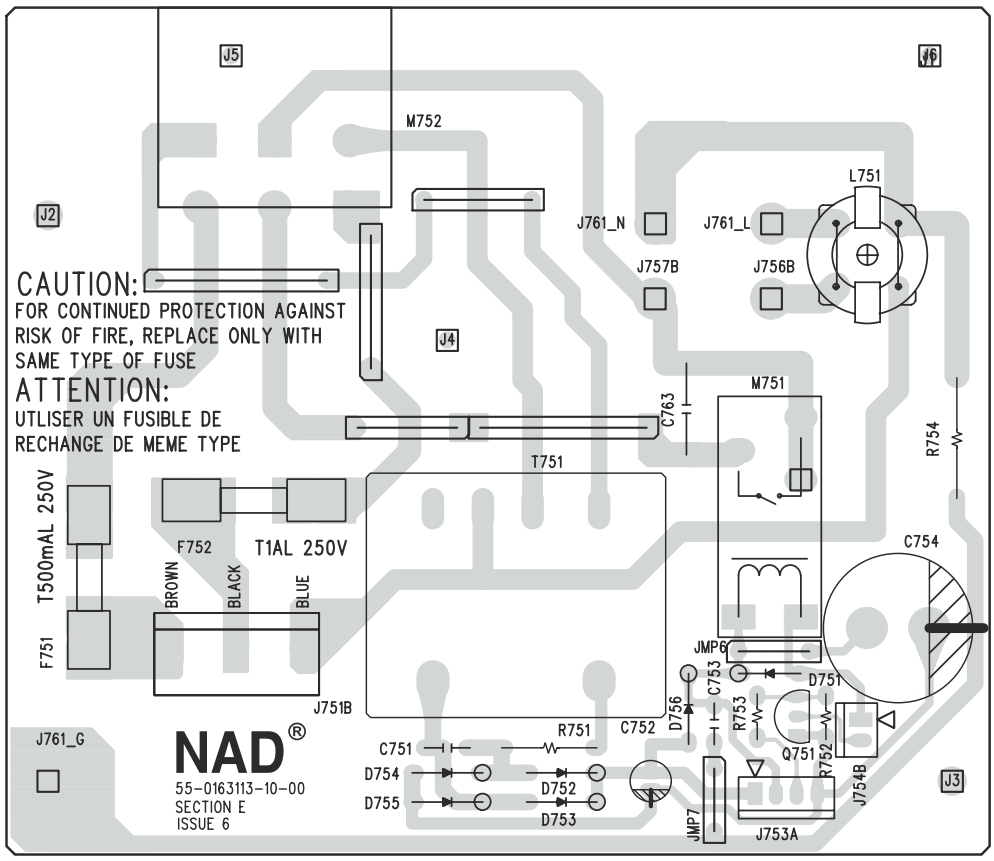
MULTI-CHANNEL BOARD - COMPONENT SIDE



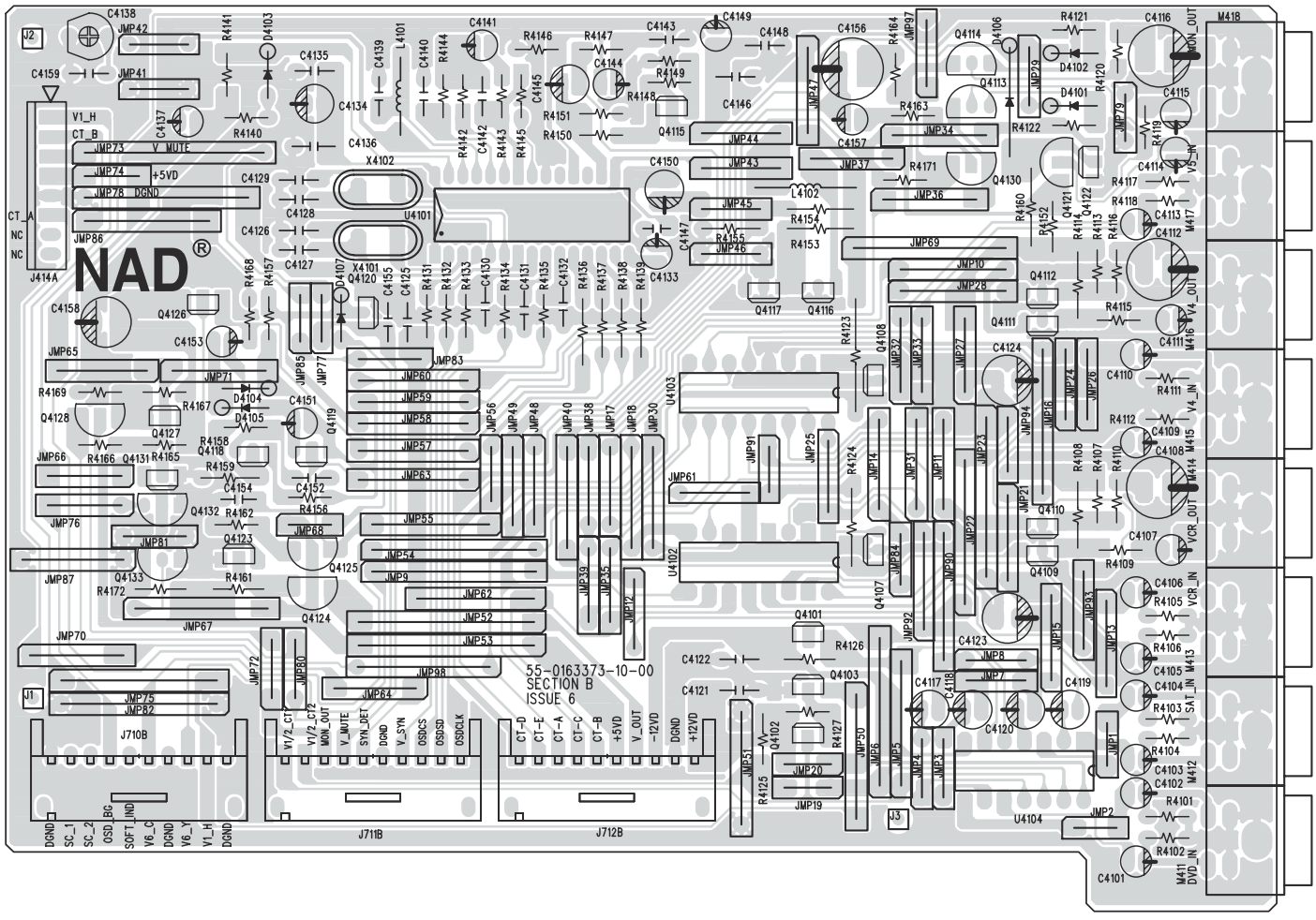
MULTI-CHANNEL BOARD - COPPER SIDE



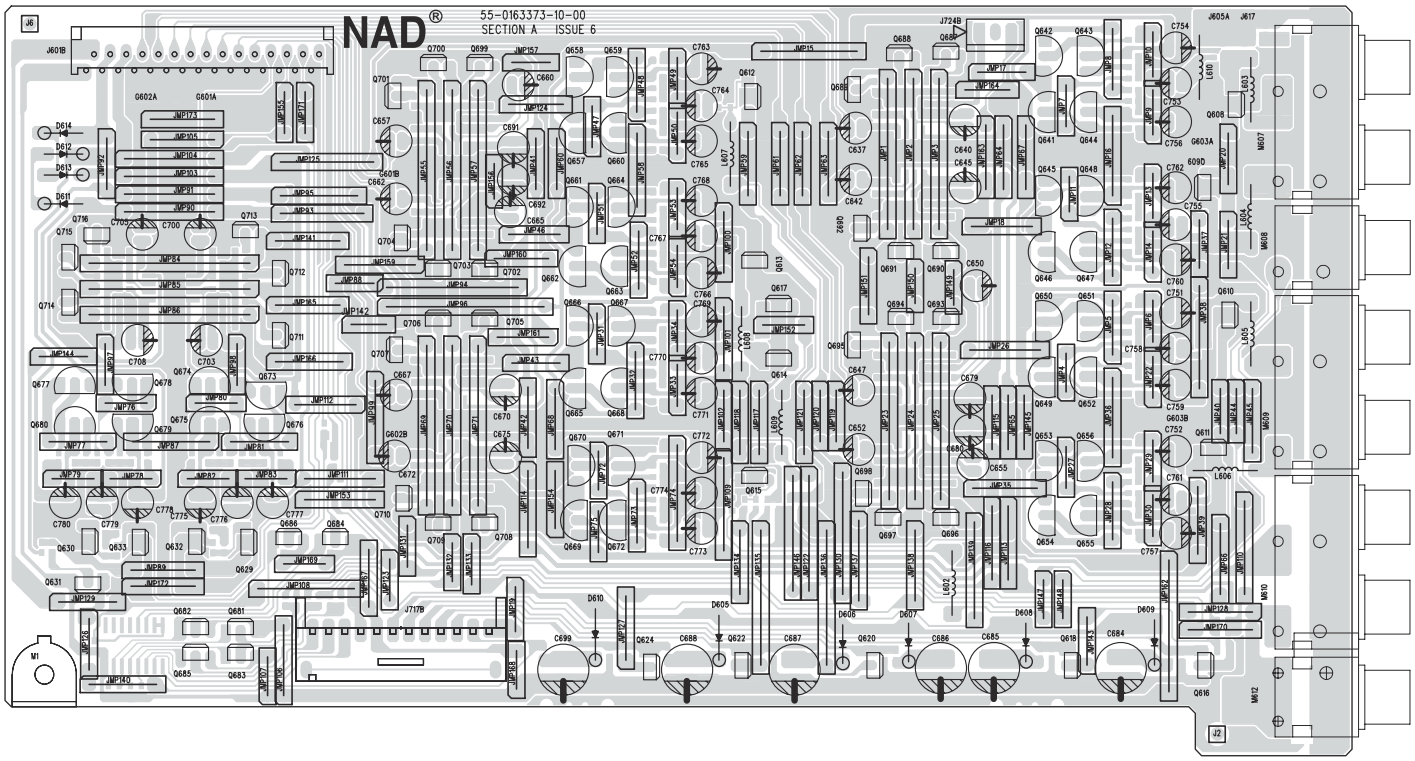
POWER SUPPLY (STANDBY)



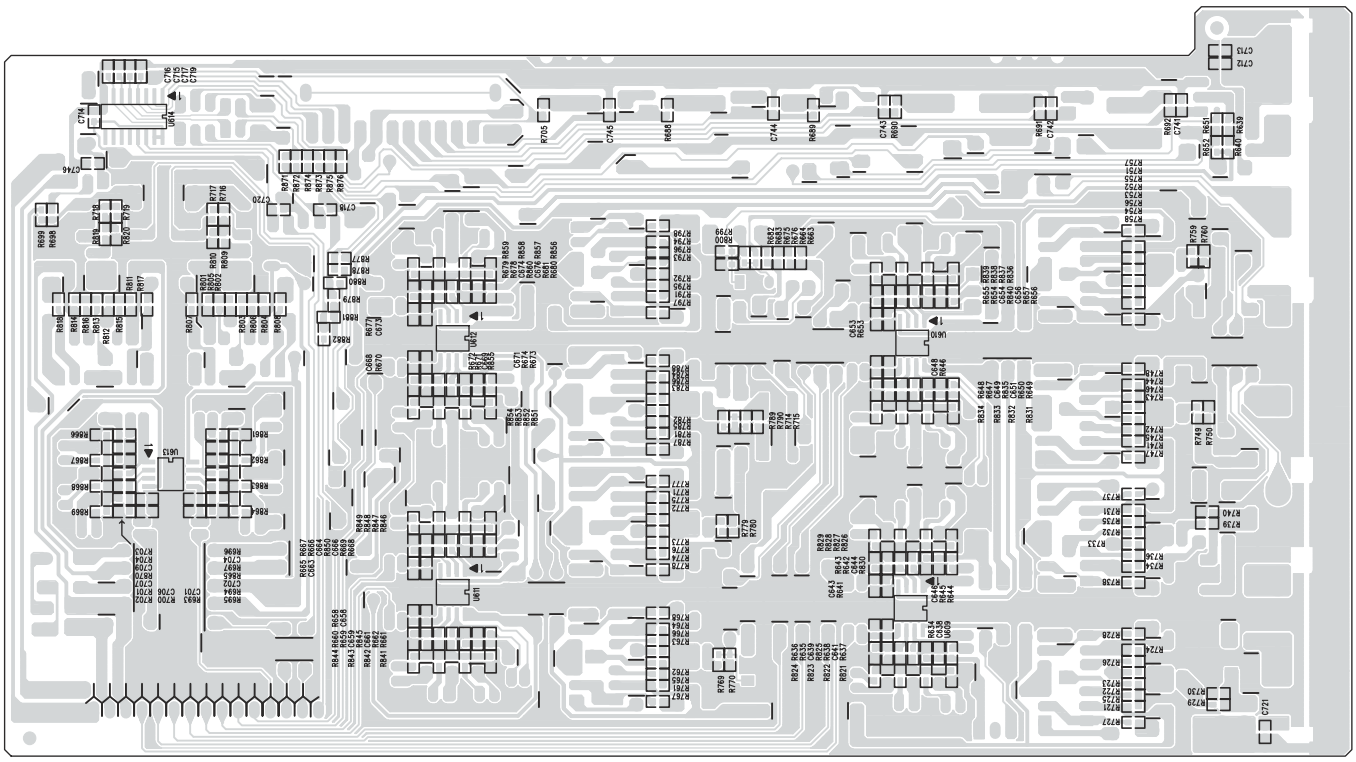
S-VIDEO BOARD



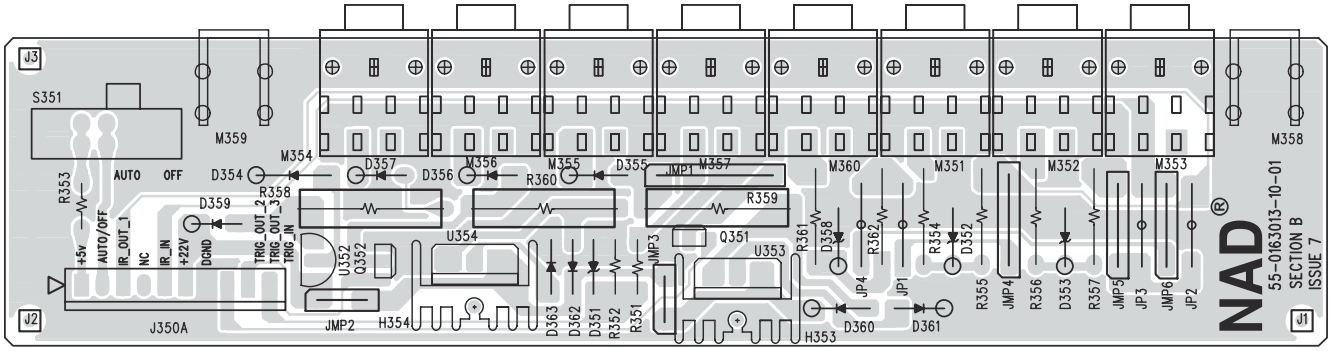
PRE-OUT BOARD - COMPONENT SIDE



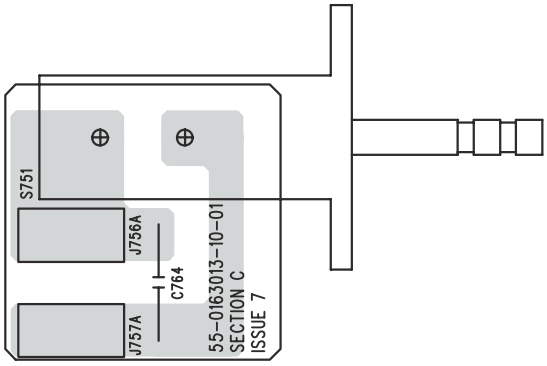
PRE-OUT BOARD - COPPER SIDE



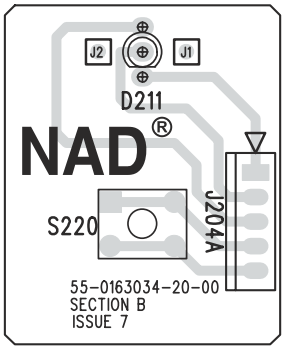
TRIGGER BOARD



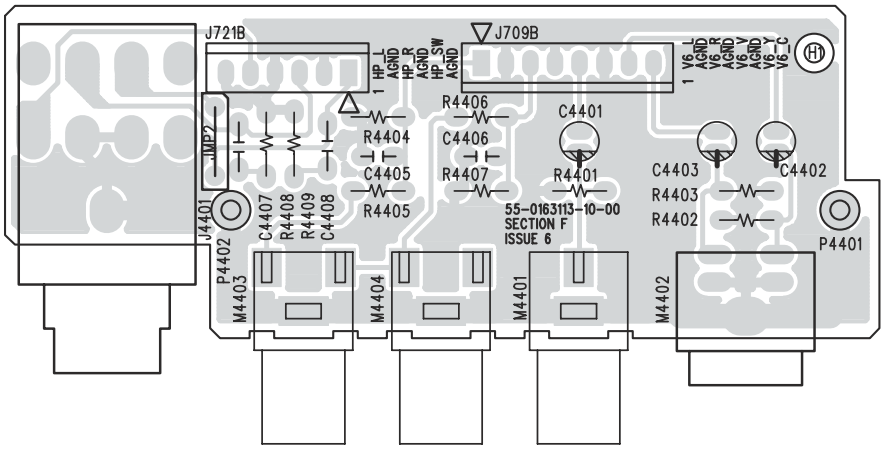
POWER SWITCH



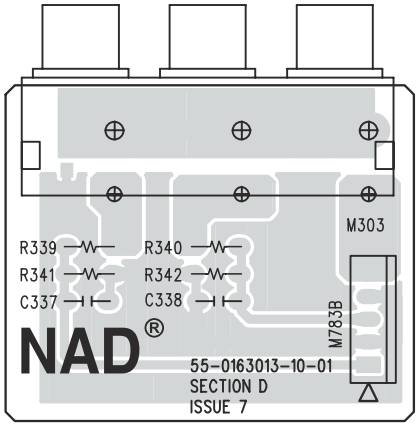
LED BOARD



VIDEO 6 BOARD

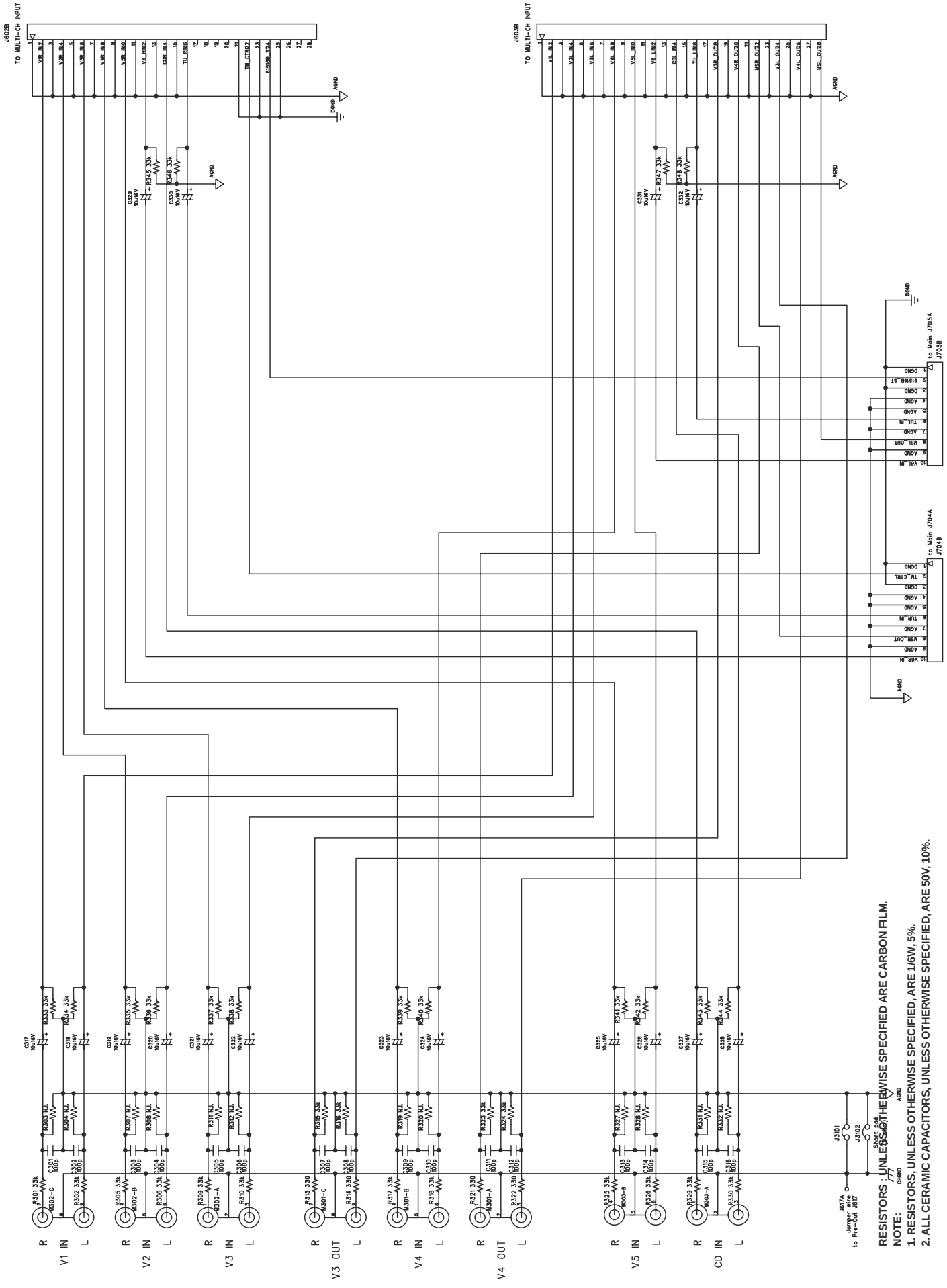


MULTI SOURCE

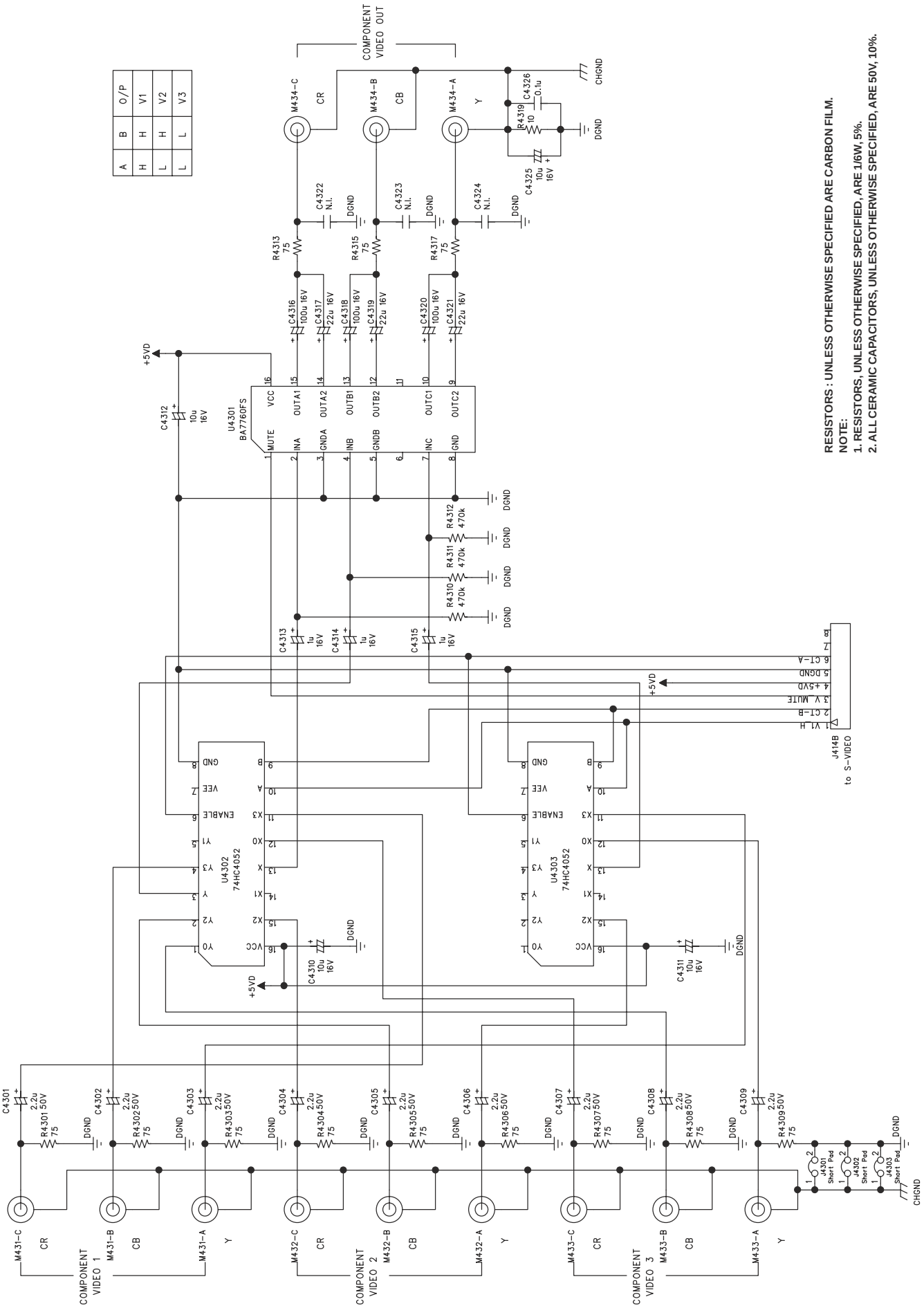


SCHEMATIC DIAGRAM

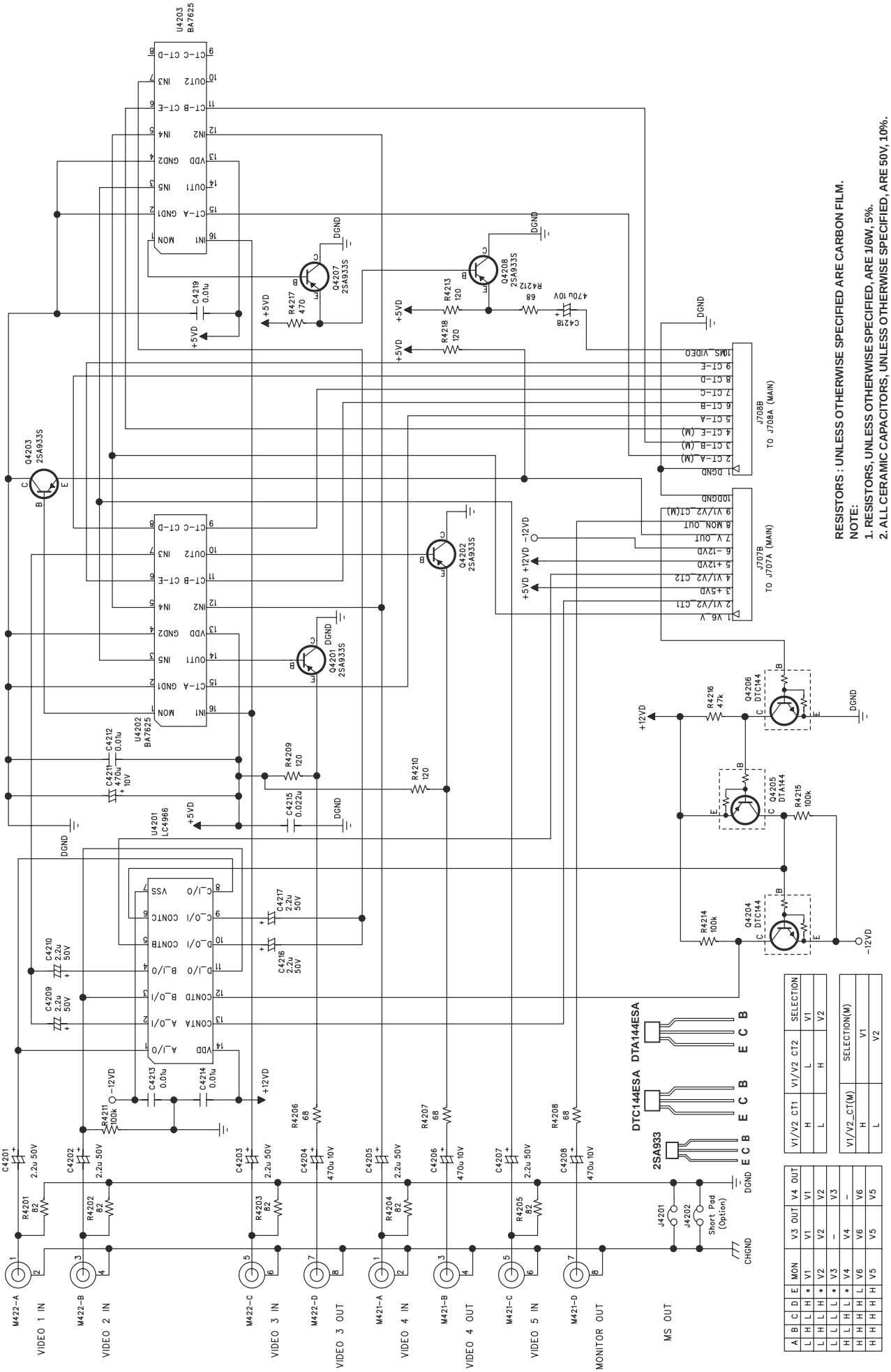
AUDIO SWITCH



COMPONENT VIDEO



COMPOSITE VIDEO

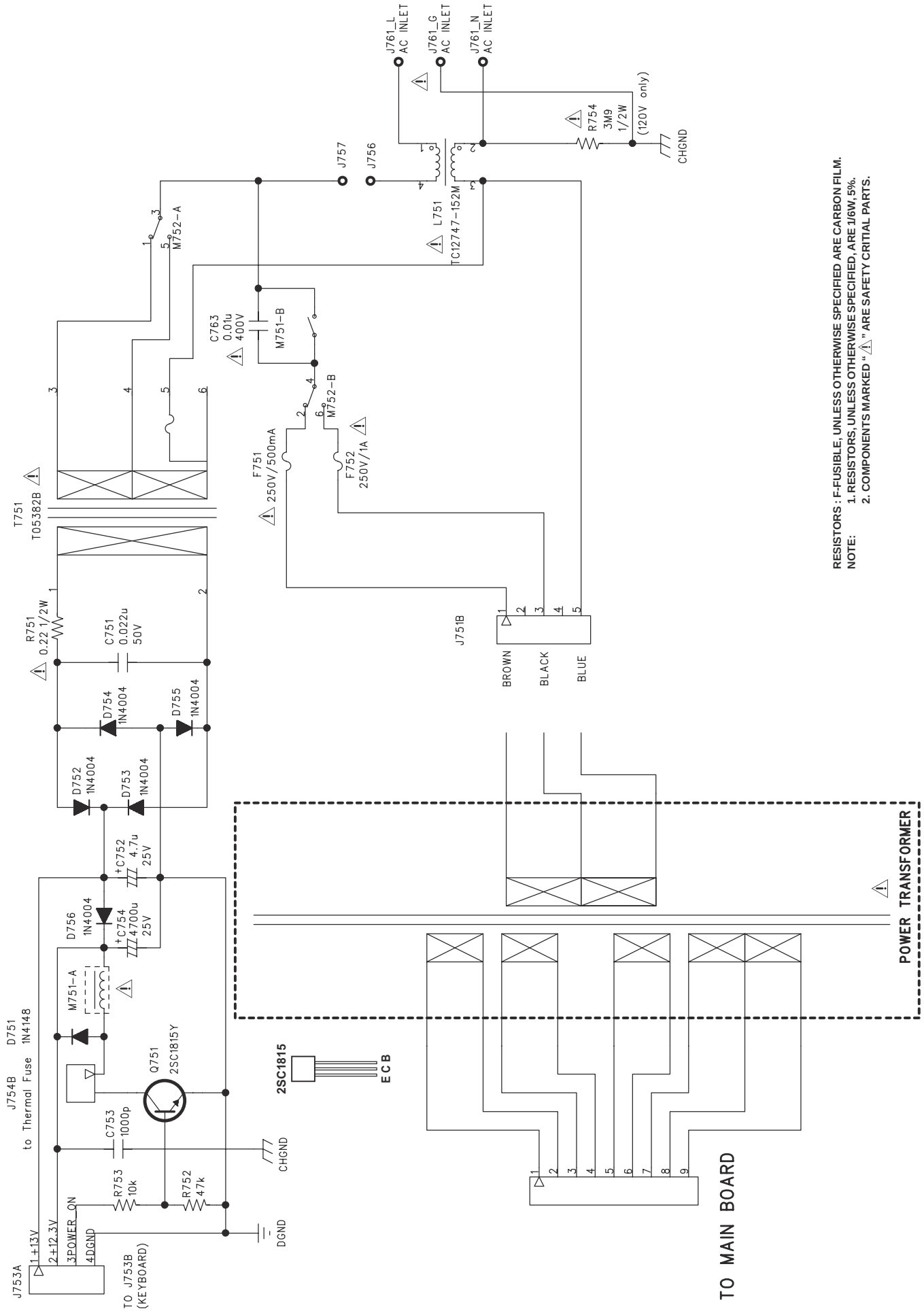


A	B	C	D	E	MON	V3 OUT	V4 OUT
L	H	L	H	*	V1	V1	V1
L	H	L	H	*	V2	V2	V2
L	L	L	L	*	V3	–	V3
H	L	H	L	*	V4	–	–
H	H	H	H	L	V6	V6	V6
H	H	H	H	H	V5	V5	V5

V1/V2 CT1	V1/V2 CT2	SELECTION
H	L	V1
L	H	V2

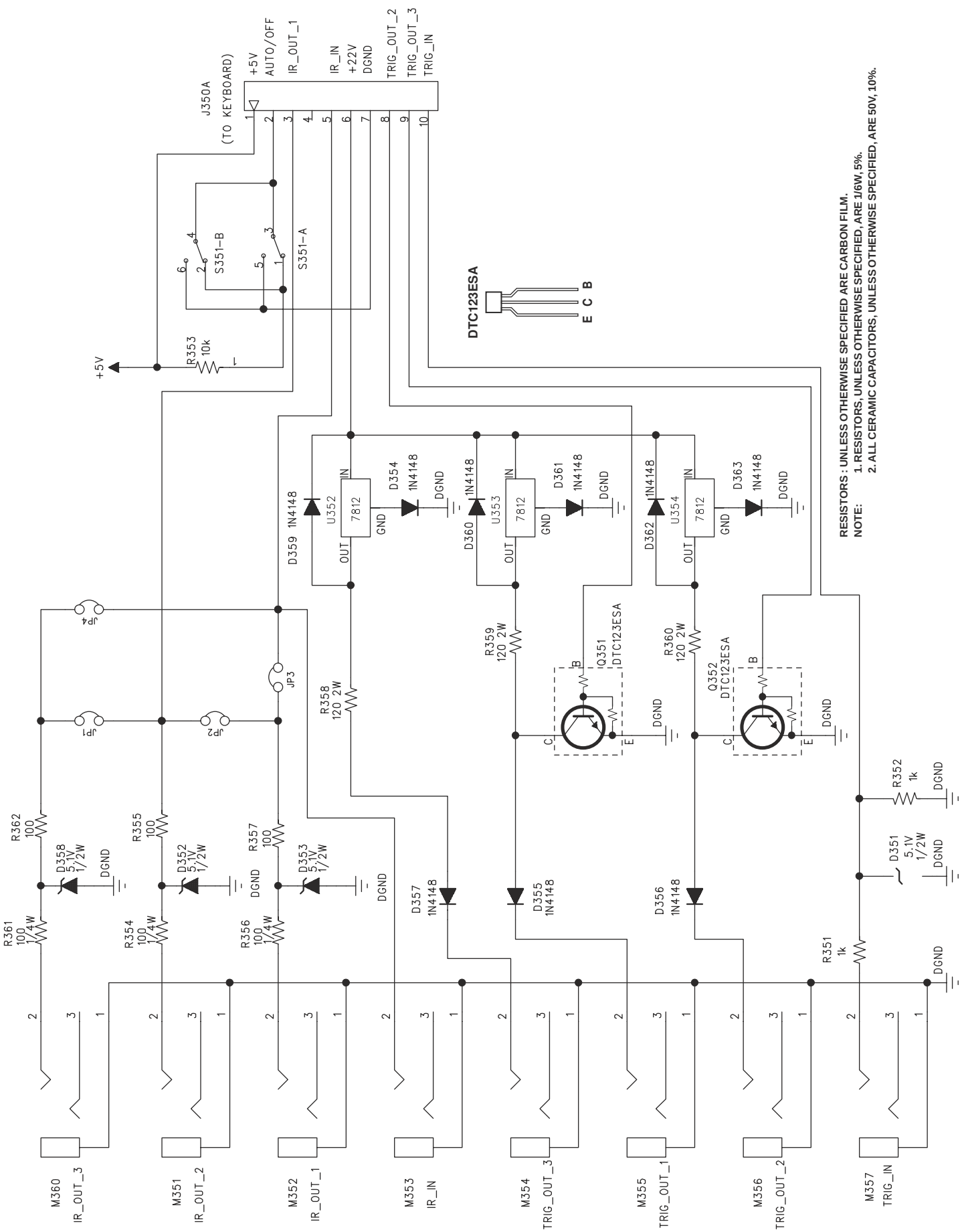
V1/V2_CT(M)	SELECTION(M)
H	V1
L	V2

POWER SUPPLY (STAND BY)



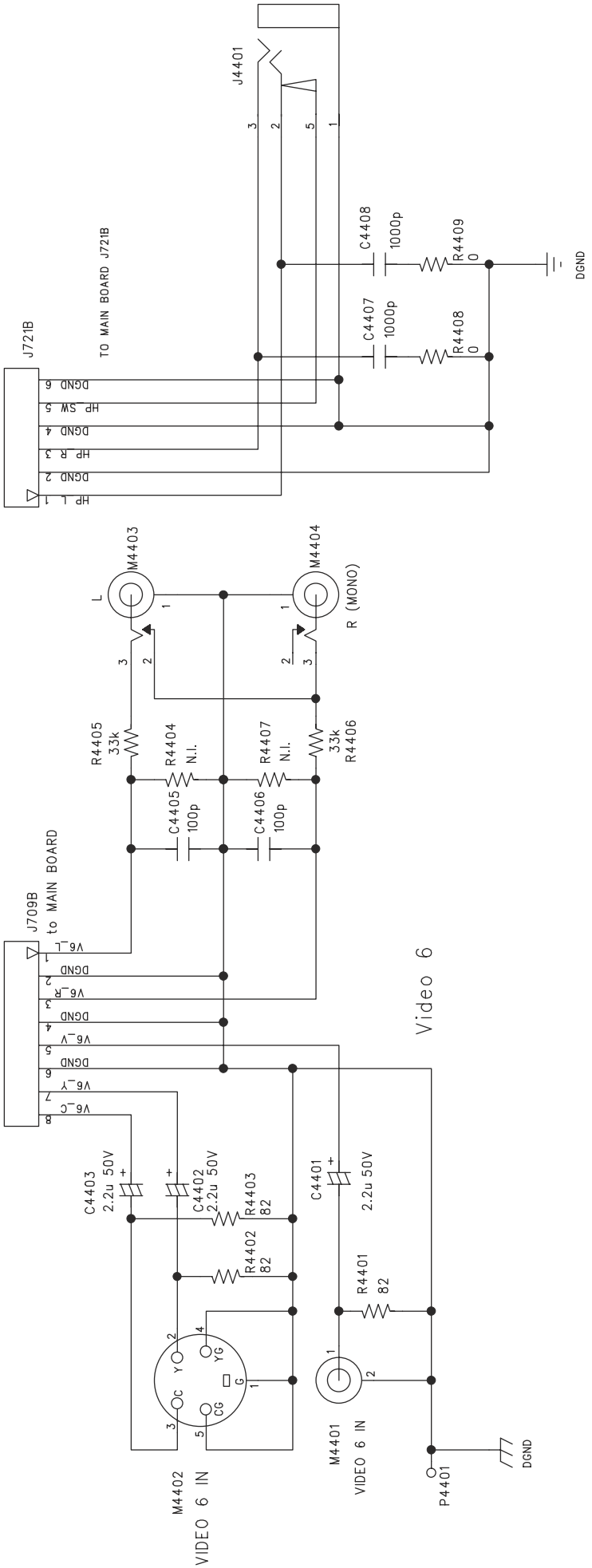
RESISTORS : F-FUSIBLE, UNLESS OTHERWISE SPECIFIED ARE CARBON FILM.
NOTE: 1. RESISTORS, UNLESS OTHERWISE SPECIFIED, ARE 1/6W, 5%.
2. COMPONENTS MARKED "⚠" ARE SAFETY CRITIAL PARTS.

TRIGGER



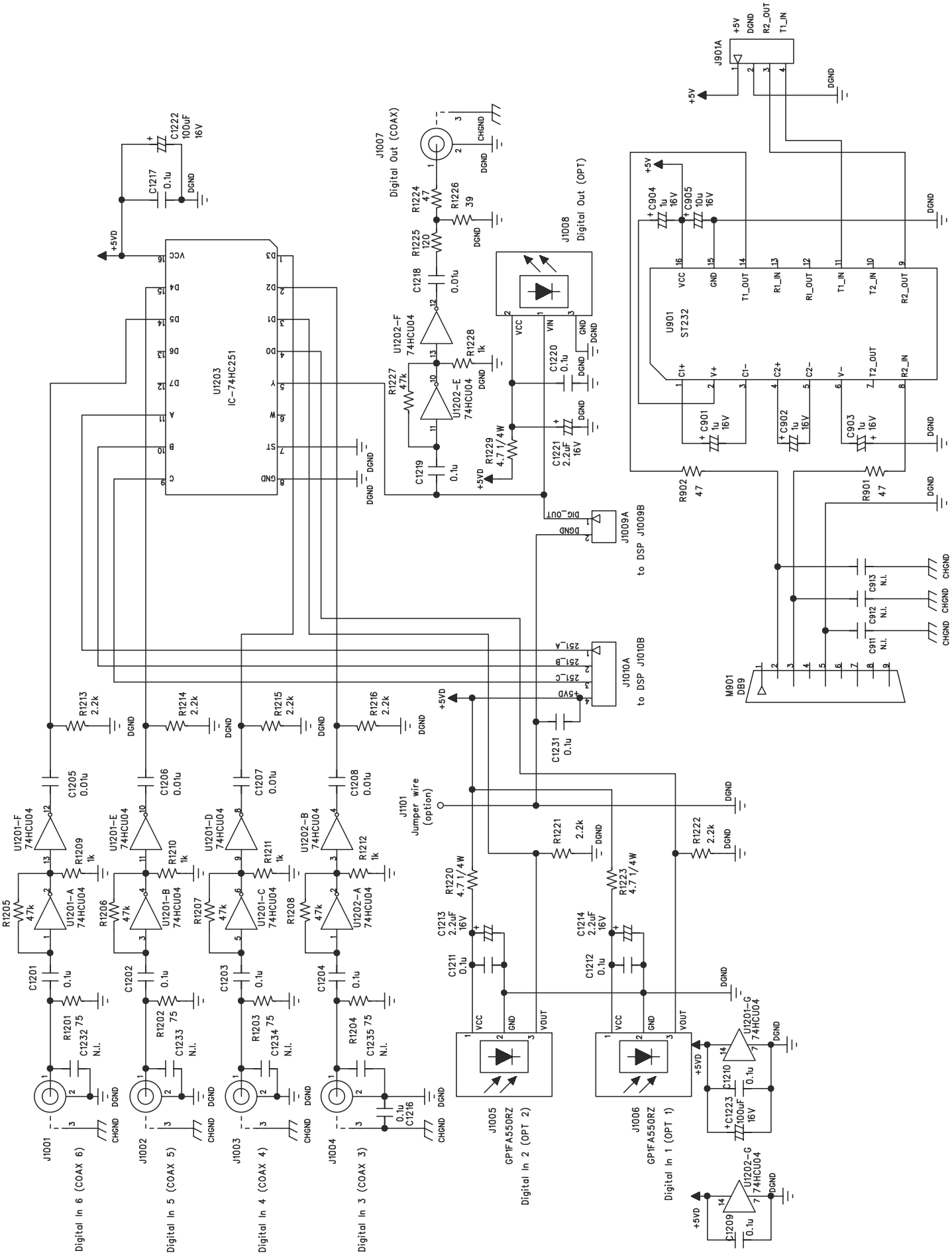
RESISTORS : UNLESS OTHERWISE SPECIFIED ARE CARBON FILM.
NOTE: 1. RESISTORS, UNLESS OTHERWISE SPECIFIED, ARE 1/6W, 5%.
2. ALL CERAMIC CAPACITORS, UNLESS OTHERWISE SPECIFIED, ARE 50V, 10%.

VIDEO 6

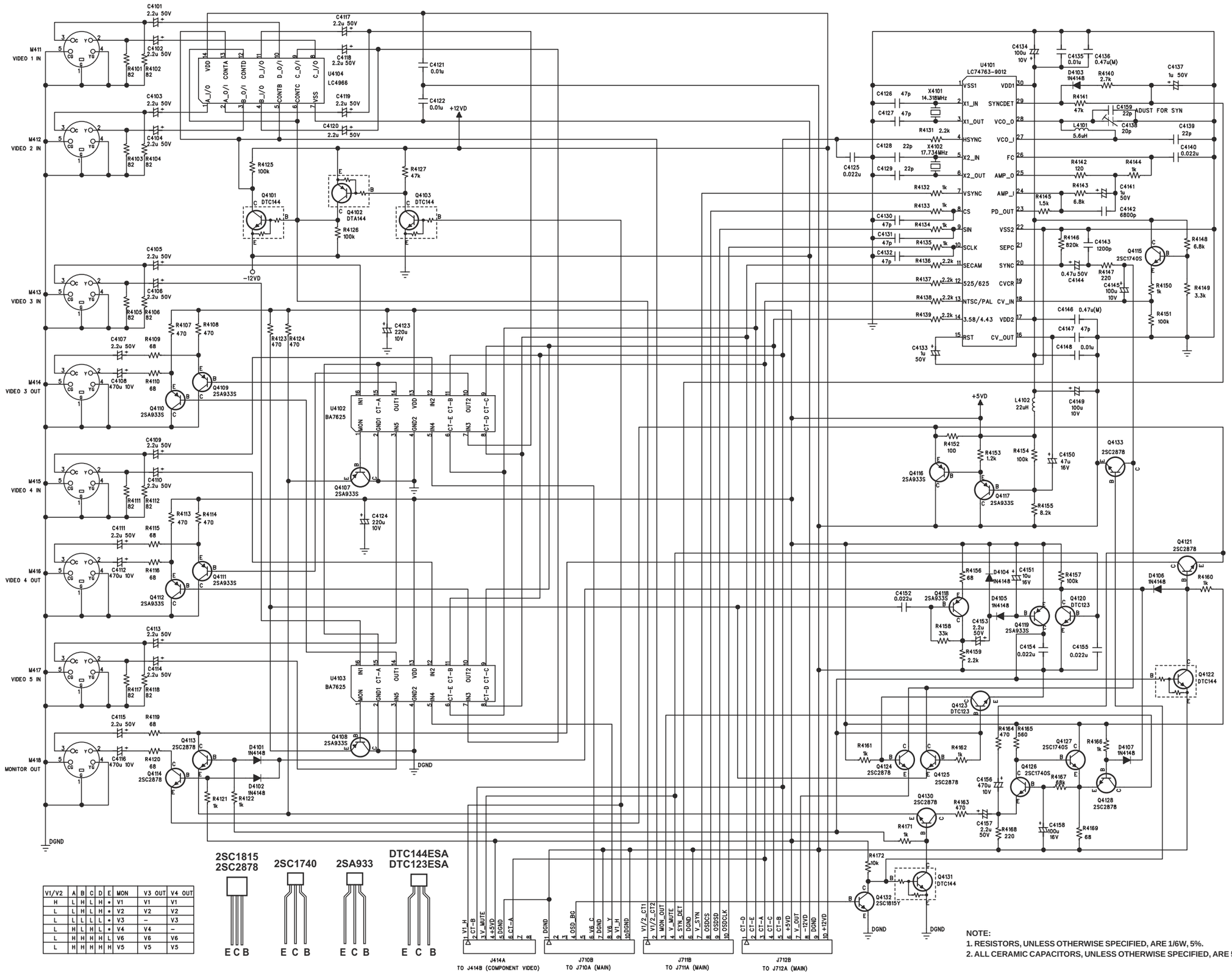


RESISTORS : UNLESS OTHERWISE SPECIFIED ARE CARBON FILM.
NOTE:
1. RESISTORS, UNLESS OTHERWISE SPECIFIED, ARE 1/6W, 5%.
2. ALL CERAMIC CAPACITORS, UNLESS OTHERWISE SPECIFIED, ARE 50V, 10%.

DIGITAL IN & OUT



S-VIDEO



V1/V2	A	B	C	D	E	MON	V3 OUT	V4 OUT
H	L	H	L	H	•	V1	V1	V1
L	L	H	L	H	•	V2	V2	V2
L	L	L	L	L	•	V3	–	V3
L	H	L	H	L	•	V4	V4	–
L	H	H	H	H	L	V6	V6	V6
L	H	H	H	H	H	V5	V5	V5

2SC1815
2SC2878

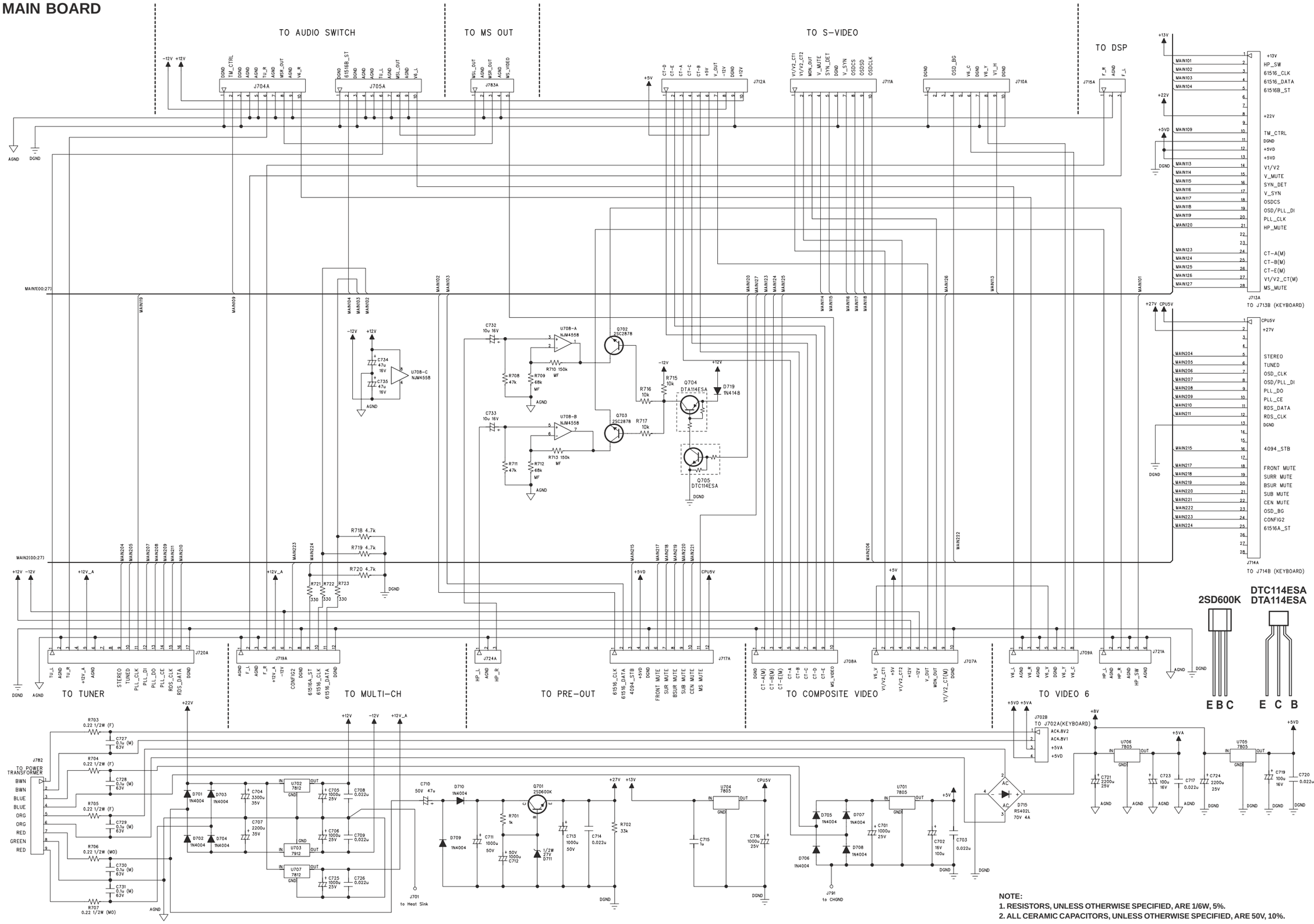
2SC1740

2SA933

DTC144ESA
DTC123ESA

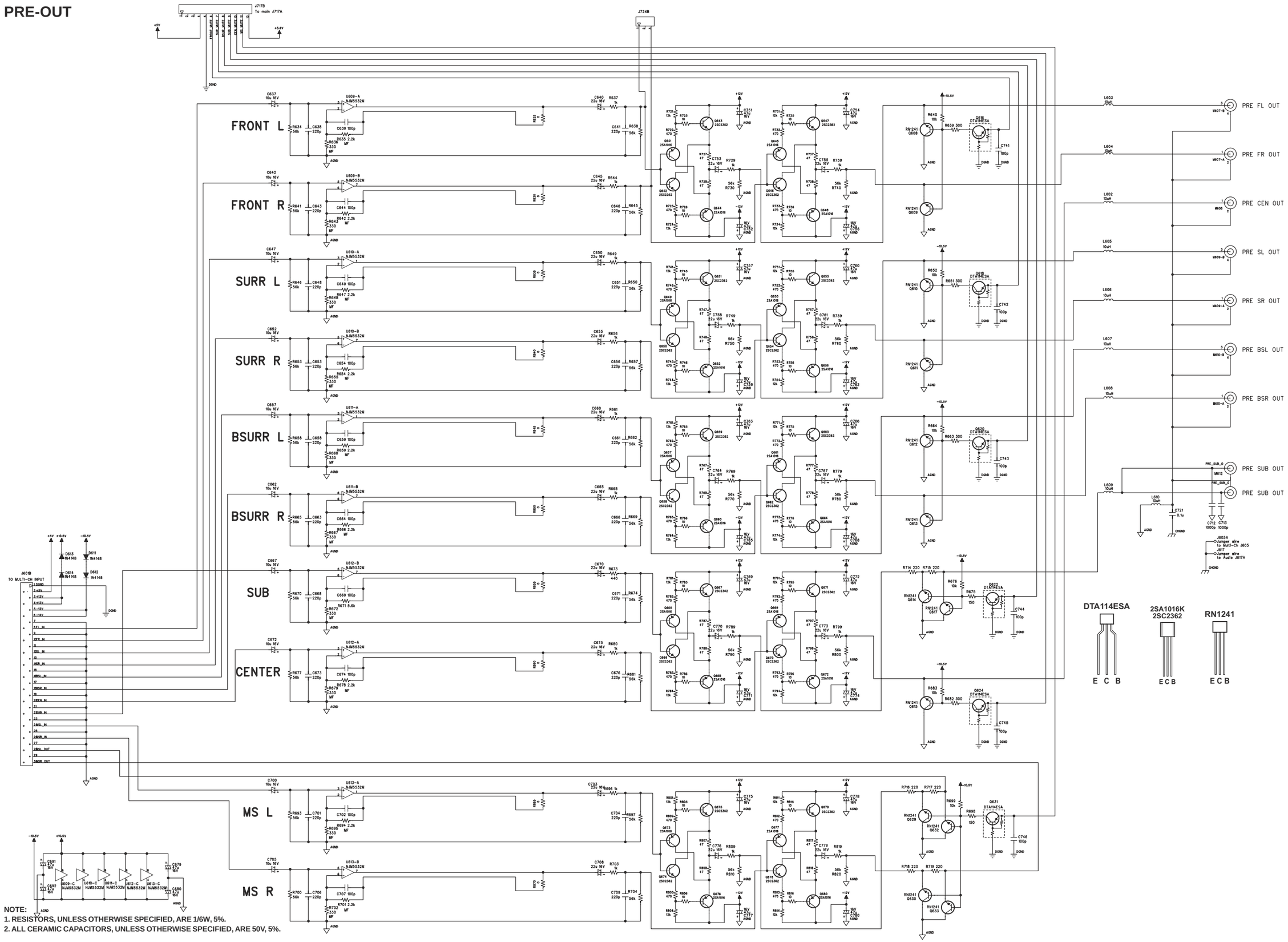
NOTE:
1. RESISTORS, UNLESS OTHERWISE SPECIFIED, ARE 1/6W, 5%.
2. ALL CERAMIC CAPACITORS, UNLESS OTHERWISE SPECIFIED, ARE 50V, 10%.

MAIN BOARD

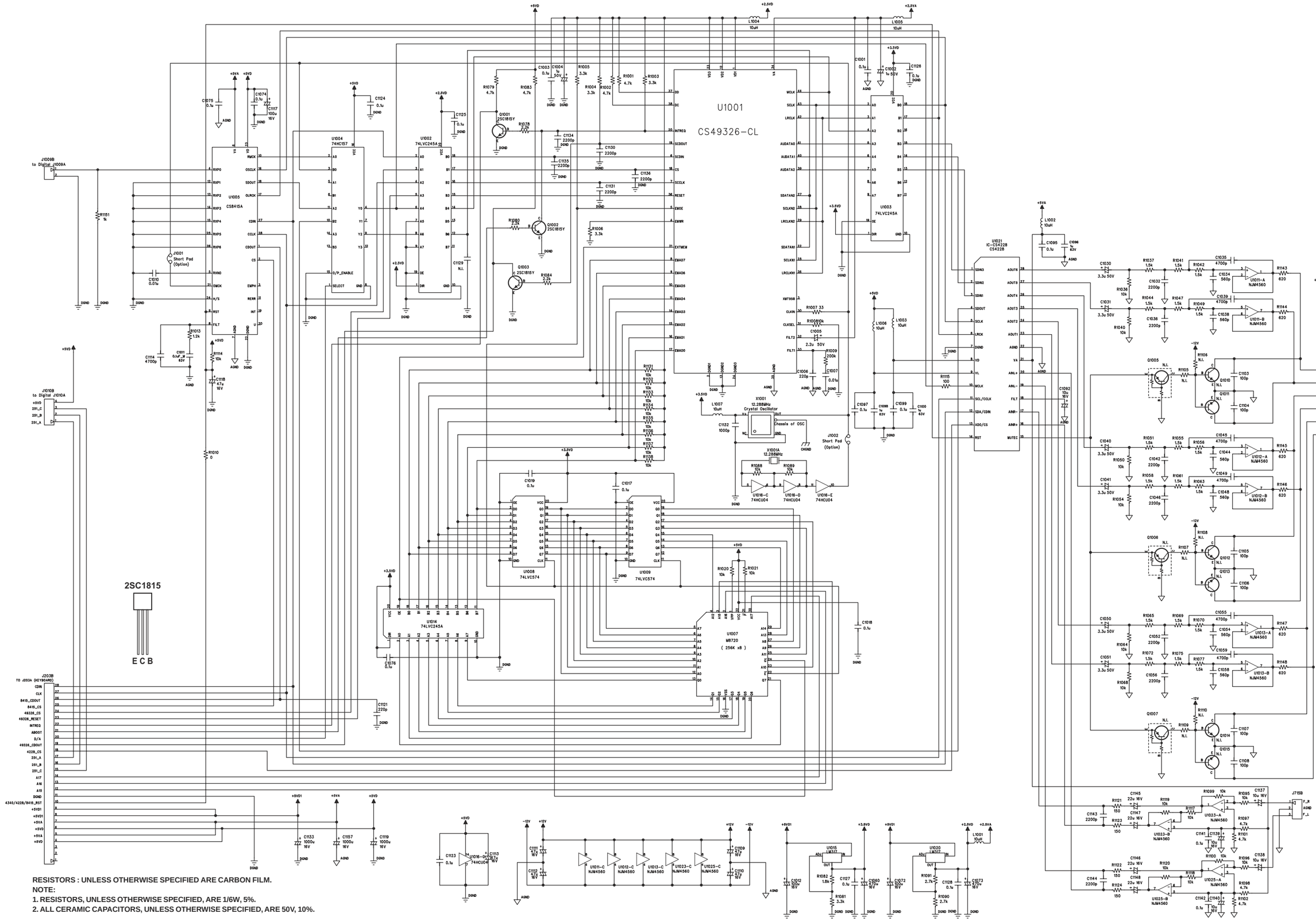


NOTE:
1. RESISTORS, UNLESS OTHERWISE SPECIFIED, ARE 1/6W, 5%.
2. ALL CERAMIC CAPACITORS, UNLESS OTHERWISE SPECIFIED, ARE 50V, 10%.

PRE-OUT

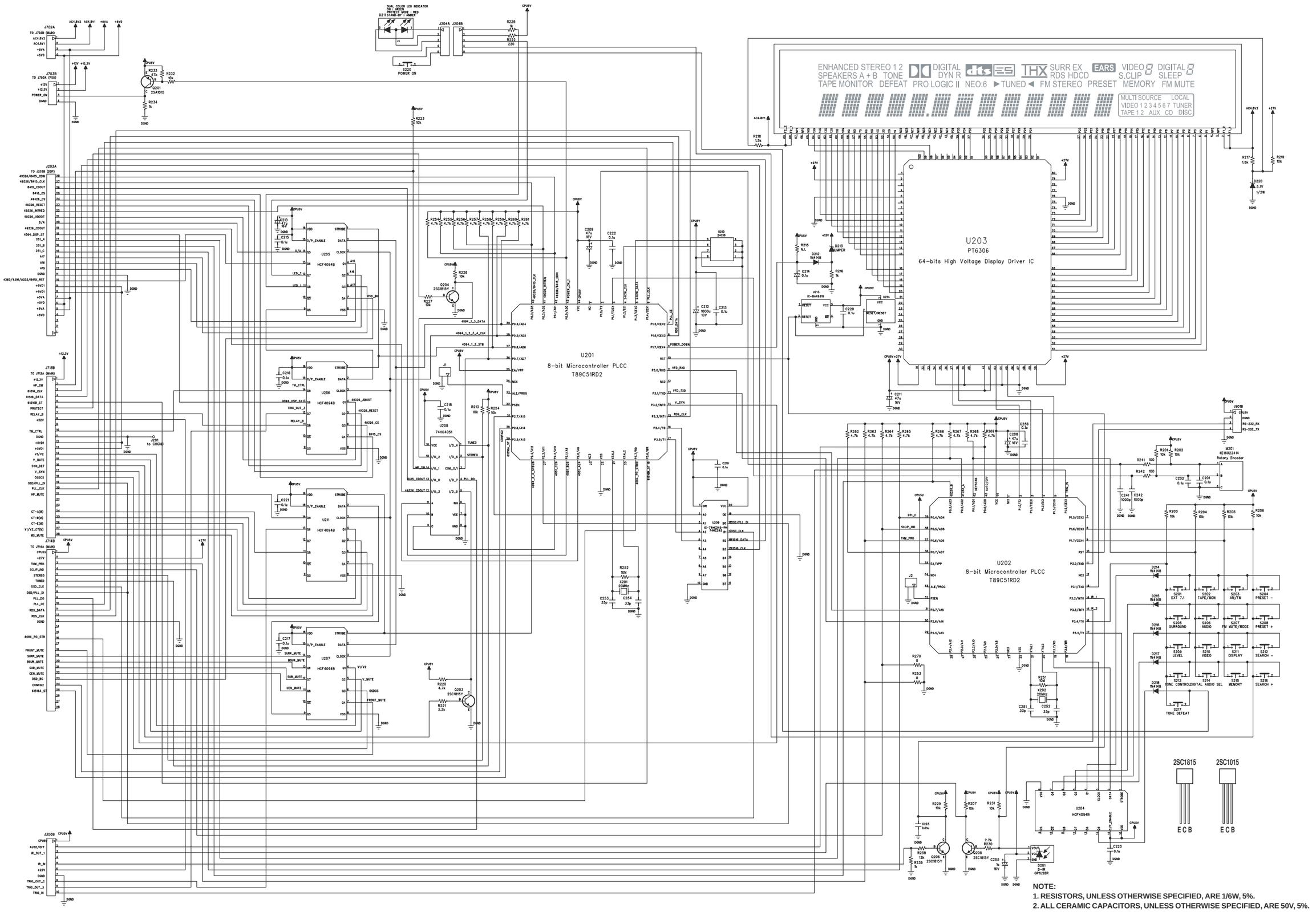

J717B
To main J717A
J724B
FRONT L
FRONT R
SURR L
SURR R
BSURR L
BSURR R
SUB
CENTER
MS L
MS R
PRE FL OUT
PRE FR OUT
PRE CEN OUT
PRE SL OUT
PRE SR OUT
PRE BSL OUT
PRE BSR OUT
PRE SUB OUT
PRE SUB OUT
J601B
TO MULTI-CH INPUT
DTA114ESA
2SA1016K
2SC2362
RN1241
E C B
E C B
E C B
NOTE:
1. RESISTORS, UNLESS OTHERWISE SPECIFIED, ARE 1/6W, 5%.
2. ALL CERAMIC CAPACITORS, UNLESS OTHERWISE SPECIFIED, ARE 50V, 5%.

DSP



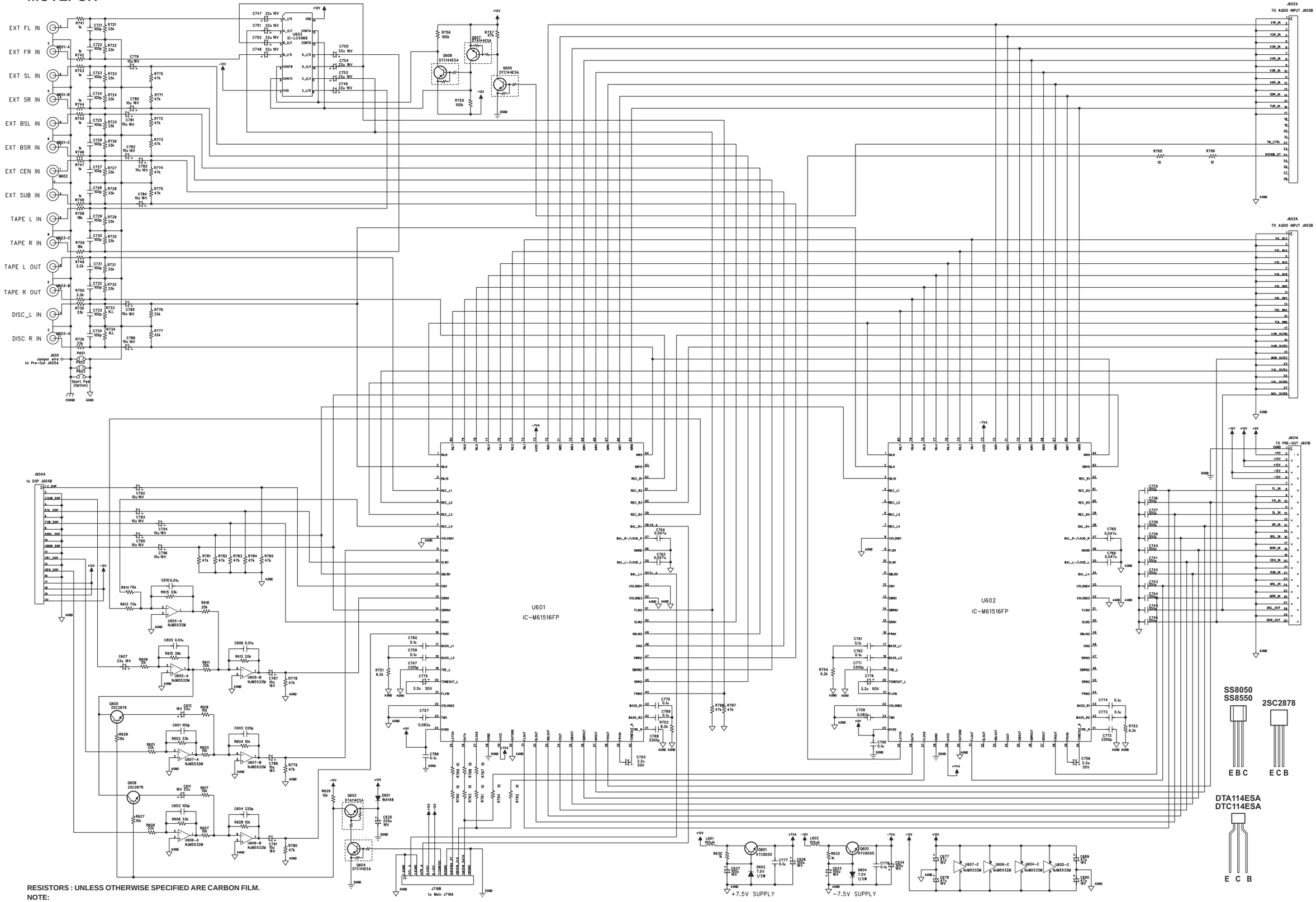
RESISTORS : UNLESS OTHERWISE SPECIFIED ARE CARBON FILM.
NOTE:
1. RESISTORS, UNLESS OTHERWISE SPECIFIED, ARE 1/6W, 5%.
2. ALL CERAMIC CAPACITORS, UNLESS OTHERWISE SPECIFIED, ARE 50V, 10%.

KEYBOARD



NOTE:
1. RESISTORS, UNLESS OTHERWISE SPECIFIED, ARE 1/6W, 5%.
2. ALL CERAMIC CAPACITORS, UNLESS OTHERWISE SPECIFIED, ARE 50V, 5%.

MUTLI-CH



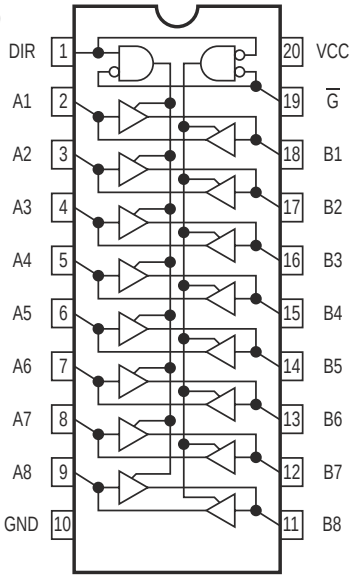
RESISTORS : UNLESS OTHERWISE SPECIFIED ARE CARBON FILM.
NOTE:
1. RESISTORS, UNLESS OTHERWISE SPECIFIED, ARE 1/6W, 5%.
2. ALL CERAMIC CAPACITORS, UNLESS OTHERWISE SPECIFIED, ARE 50V, 10%.

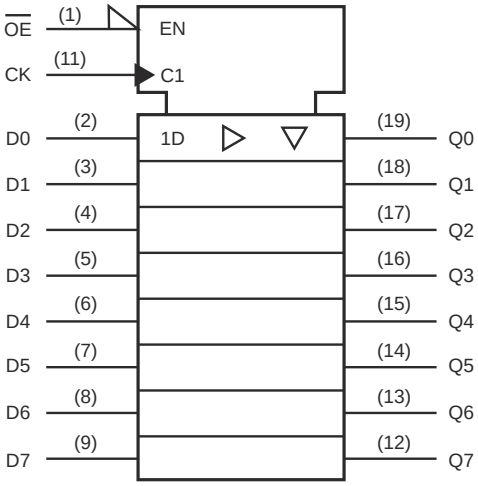
IC BLOCK DIAGRAM

74LVC245
DSP BOARD: U1002, U1003, U1014

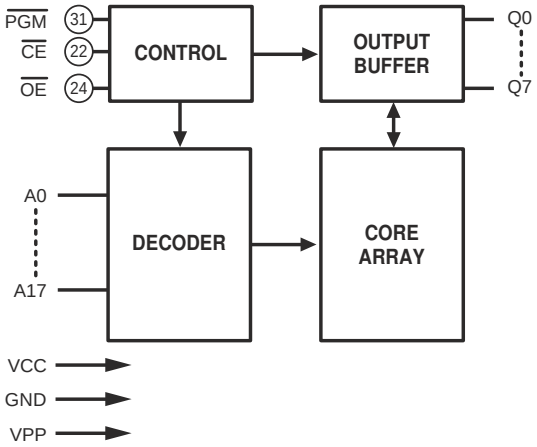
74LVQ574
DSP BOARD: U1008, U1009

74VHC245
KEYBOARD: U209

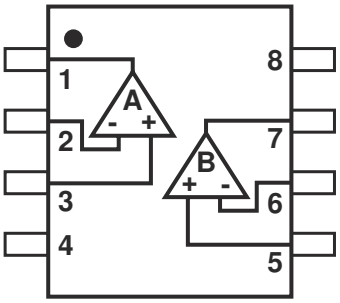




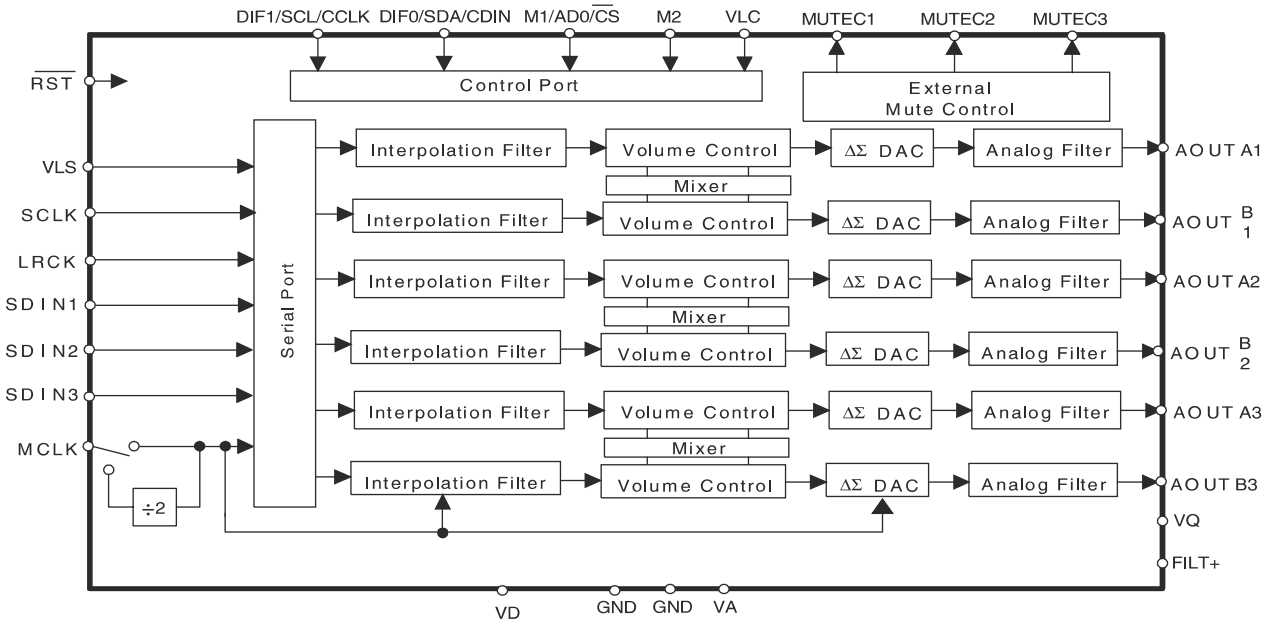
W27C020
DSP BOARD: U1007



NJM5532 / NJM4558
DSP BOARD: U1011~U1013, U1023 & U1025
MULTI-CHANNEL: U604~U607
PRE-OUT BOARD: U609~U613
MAIN BOARD: U708

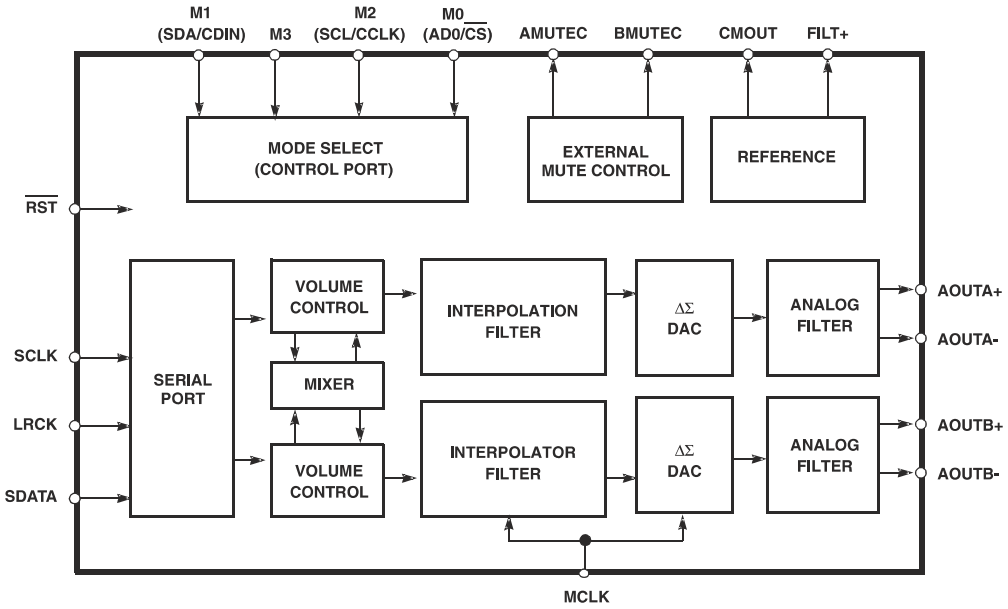


CS4360KZ
DSP BOARD: U1026



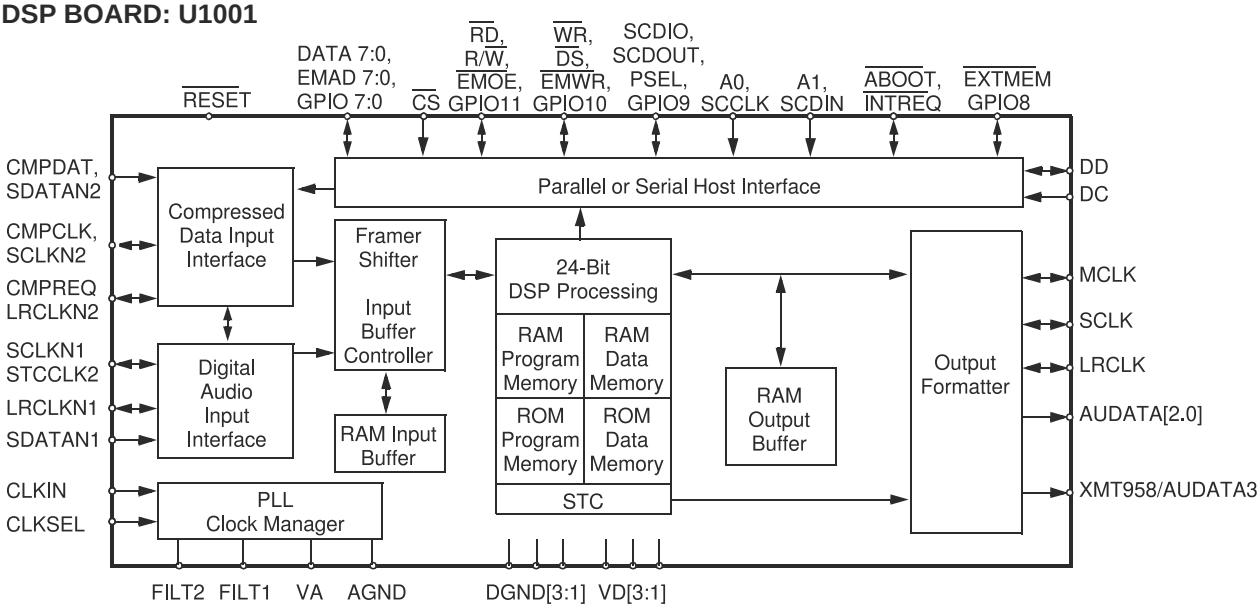
CS4392

DSP BOARD: U1025



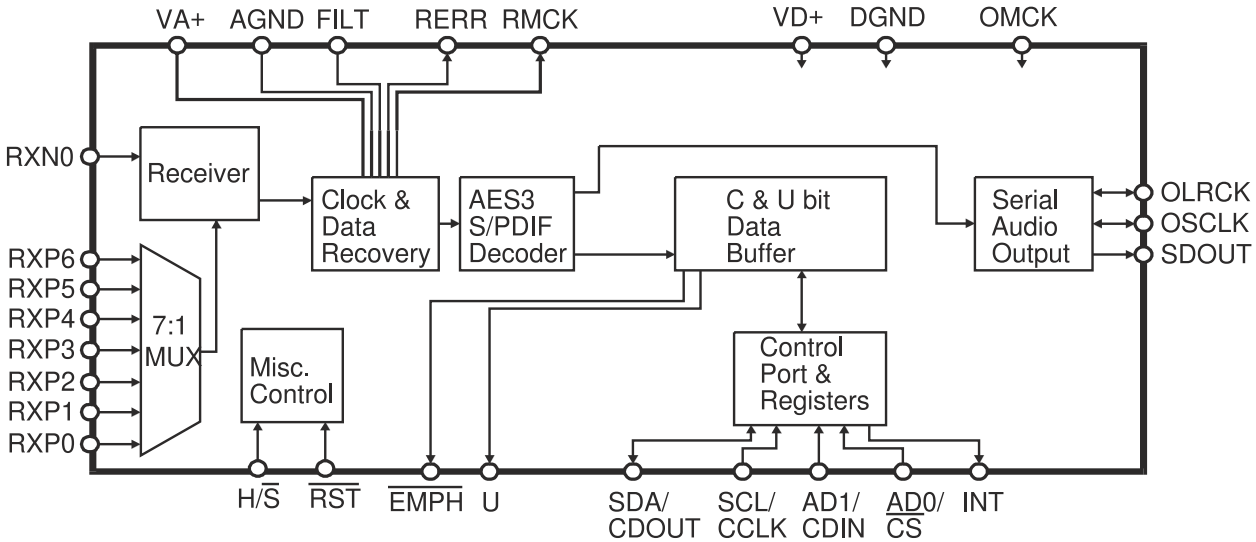
CS49326

DSP BOARD: U1001

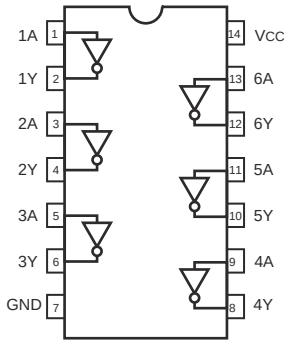


CS8415A

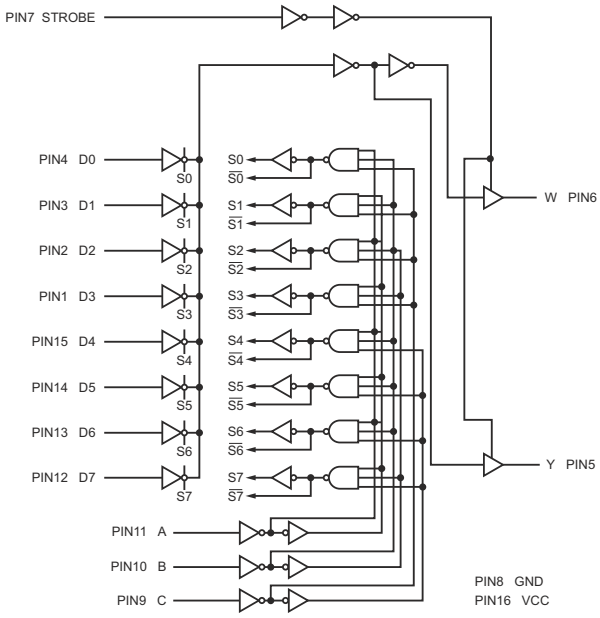
DSP BOARD: U1005



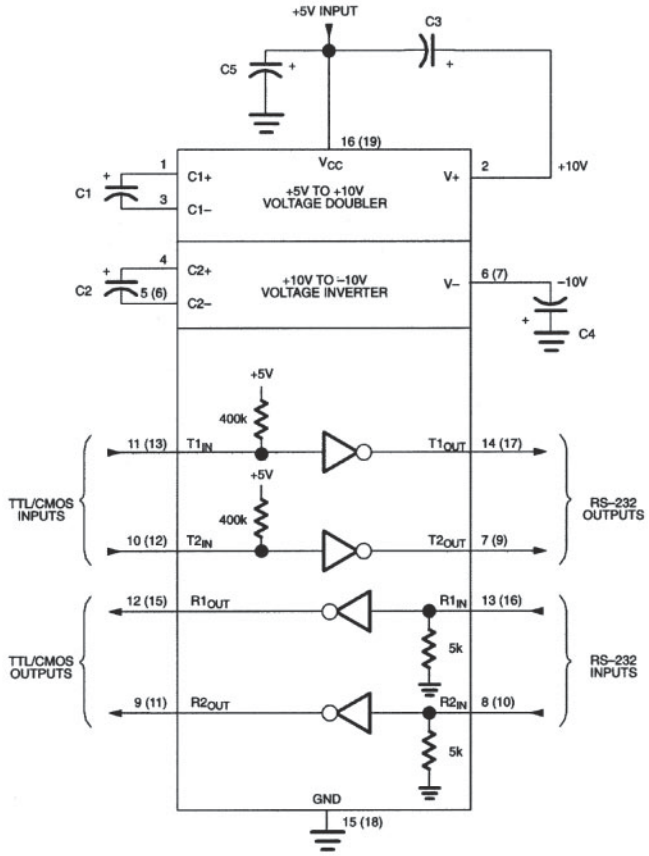
74HCU04
DIGITAL & RS232 BOARD:
U1201 & U1202



74HC251
DIGITAL & RS232 BOARD:
U1203



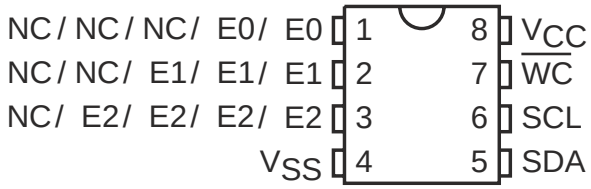
DS232A
DIGITAL & RS232 BOARD:
U901



AT24C16
KEYBOARD: U210

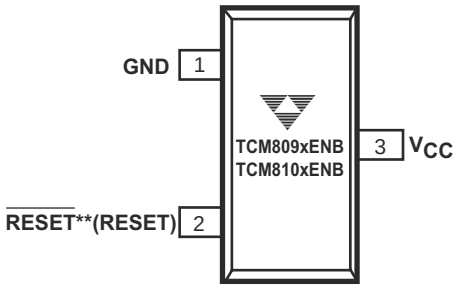
M24Cxx

16Kb/8Kb/4Kb/2Kb/1Kb



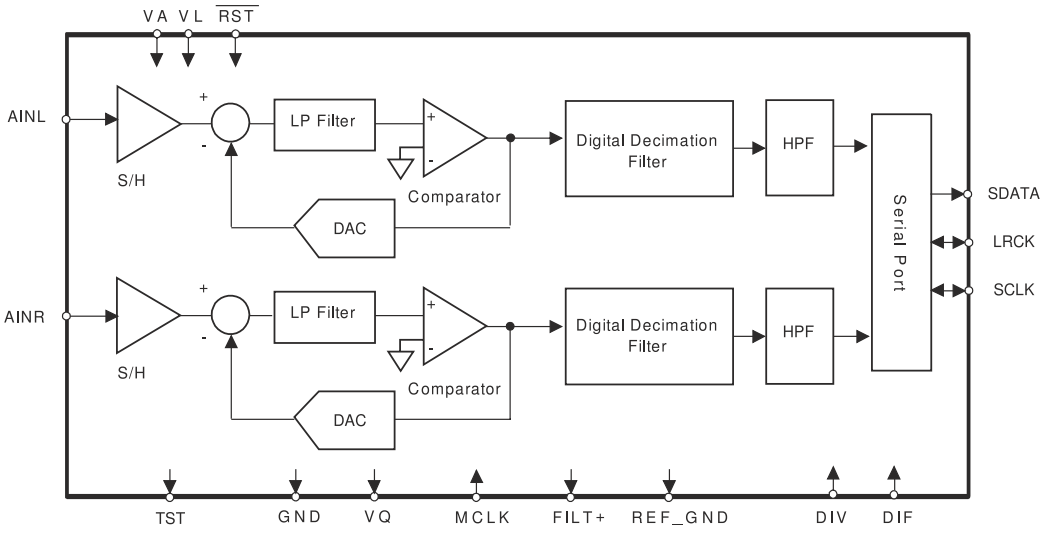
TCM810
KEYBOARD: U214

***3-Pin SOT-23B**

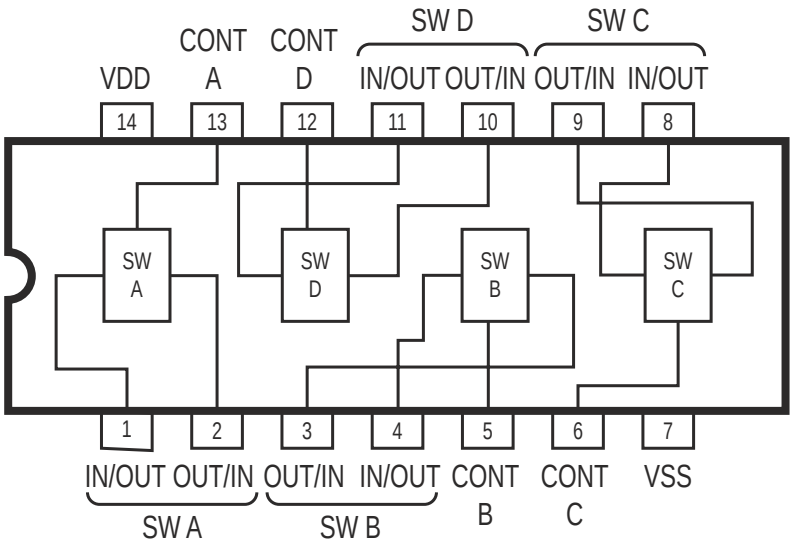


NOTE: *3-Pin SOT-23B is equivalent to JEDEC TO-236
** () is for TCM810

CS5333KZ
DSP BOARD: U1027



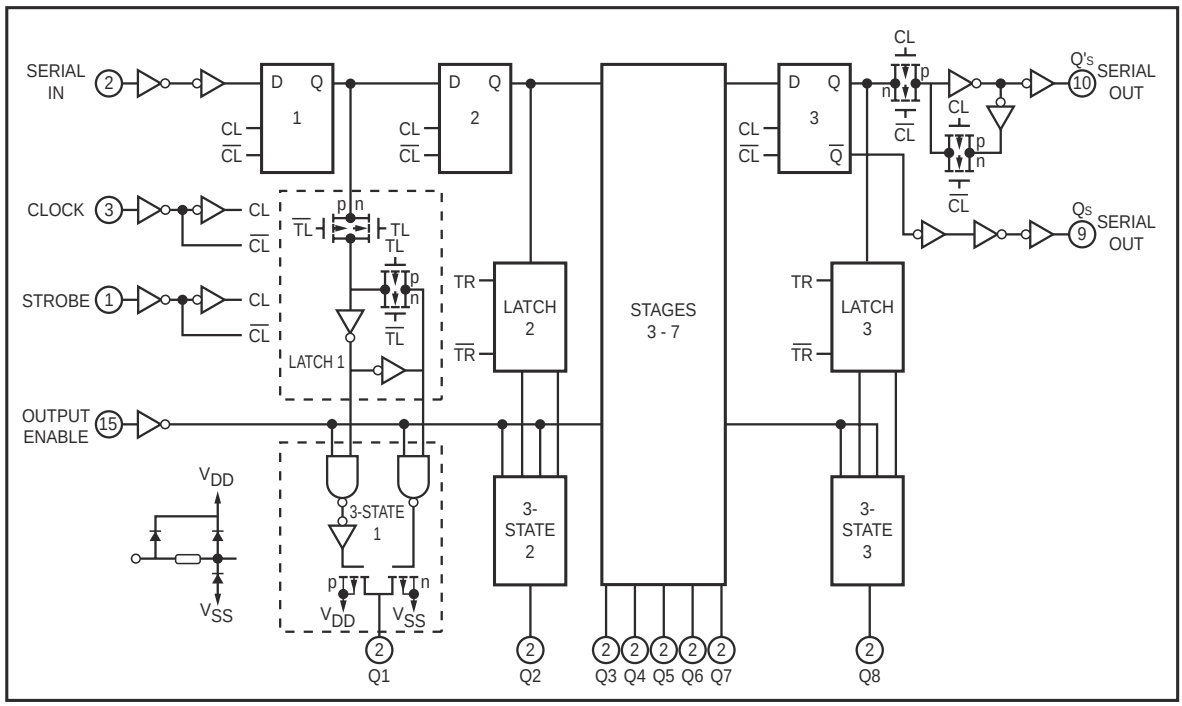
LC4966
COMPOSITE VIDEO: U4201
S-VIDEO BOARD: U4104
MULTI-CHANNEL: U6103



HCF4094B

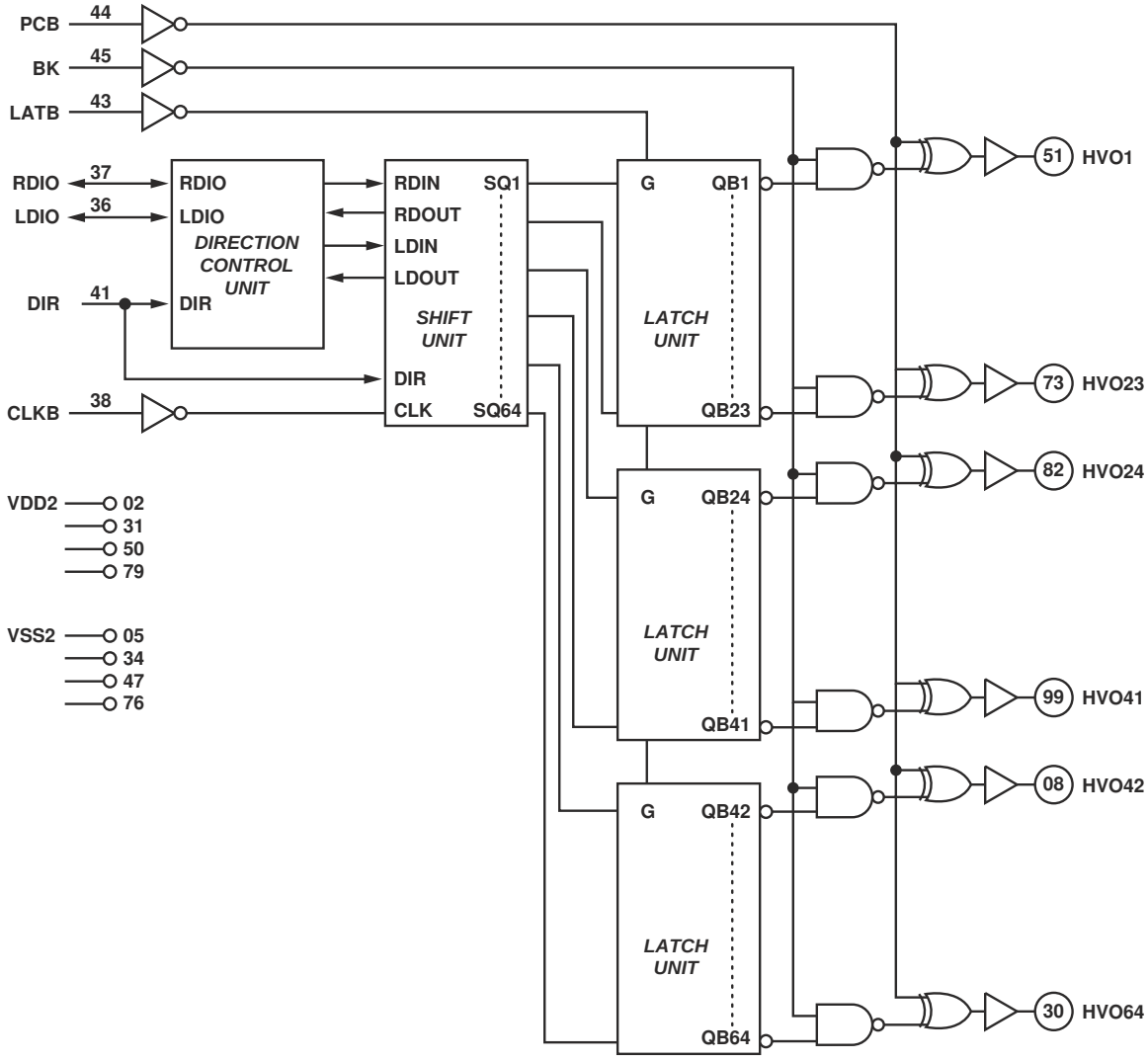
KEYBOARD: U204~U207, U211

DSP BOARD: U1029

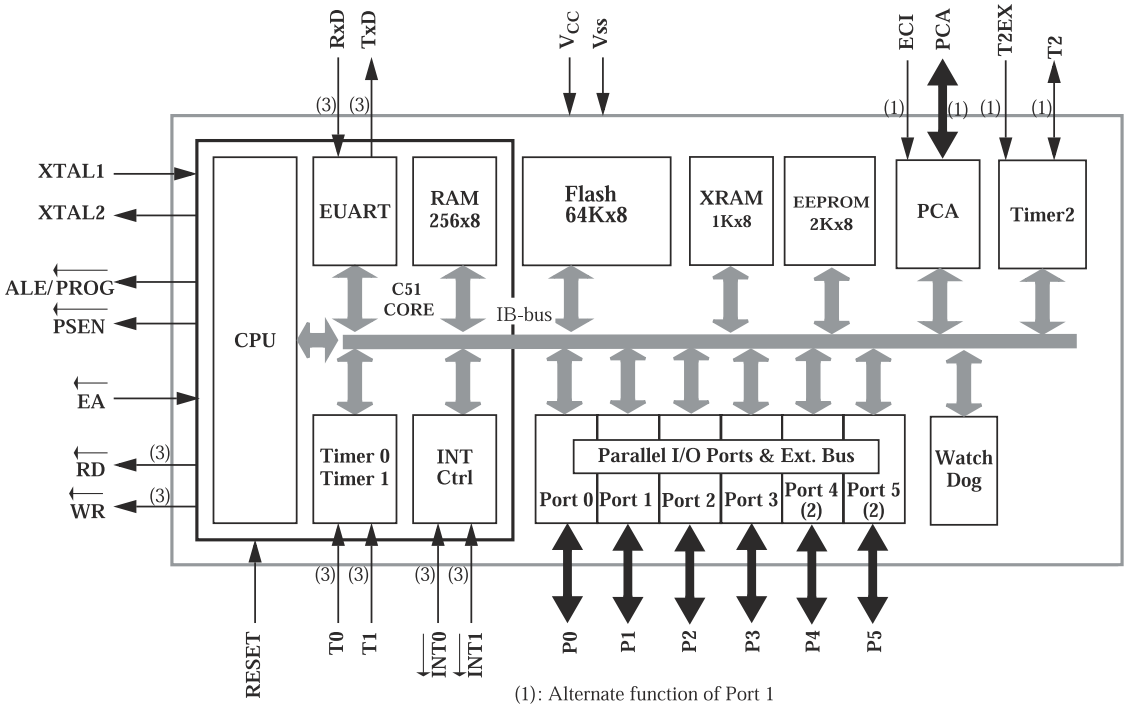


PT6306

KEYBOARD: U203

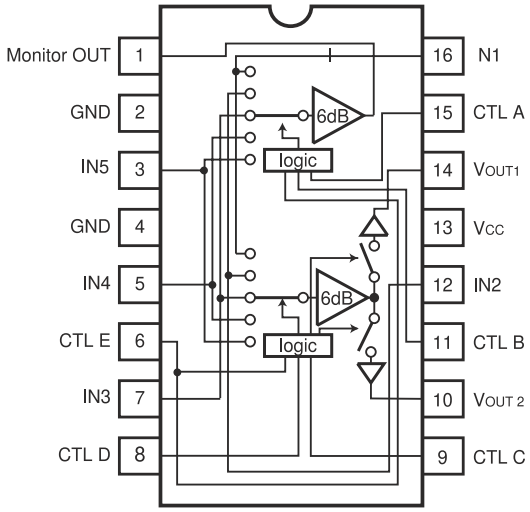


T89C51RD2
KEYBOARD: U201 & U202

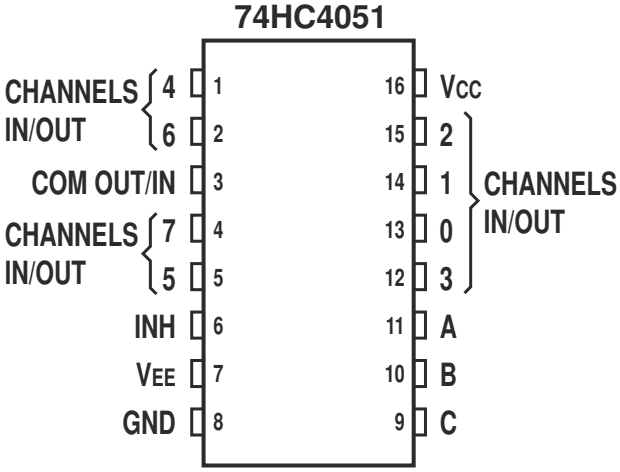


(1): Alternate function of Port 1
(2): Only available on high pin count packages
(3): Alternate function of Port 3

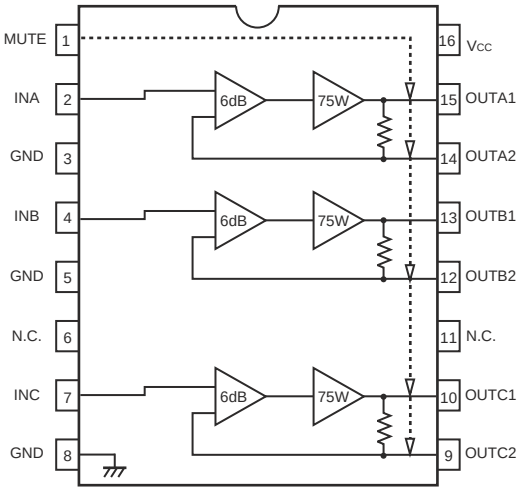
BA7625
COMPOSITE VIDEO BOARD: U4202 & U4203
S-VIDEO BOARD: U4102 & U4103



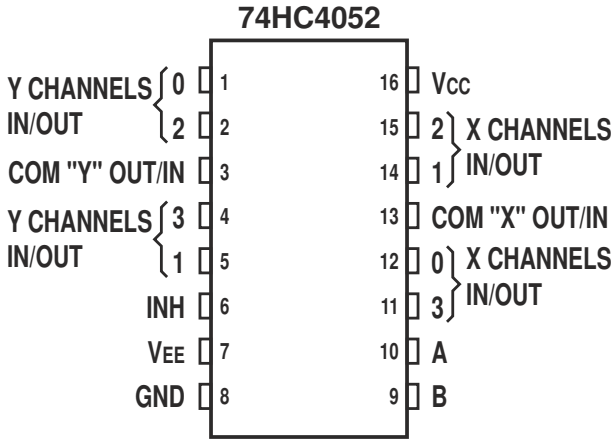
74HC4051
KEYBOARD: U208
S-VIDEO BOARD: U4102, U4103
COMPOSITE VIDEO: U4201



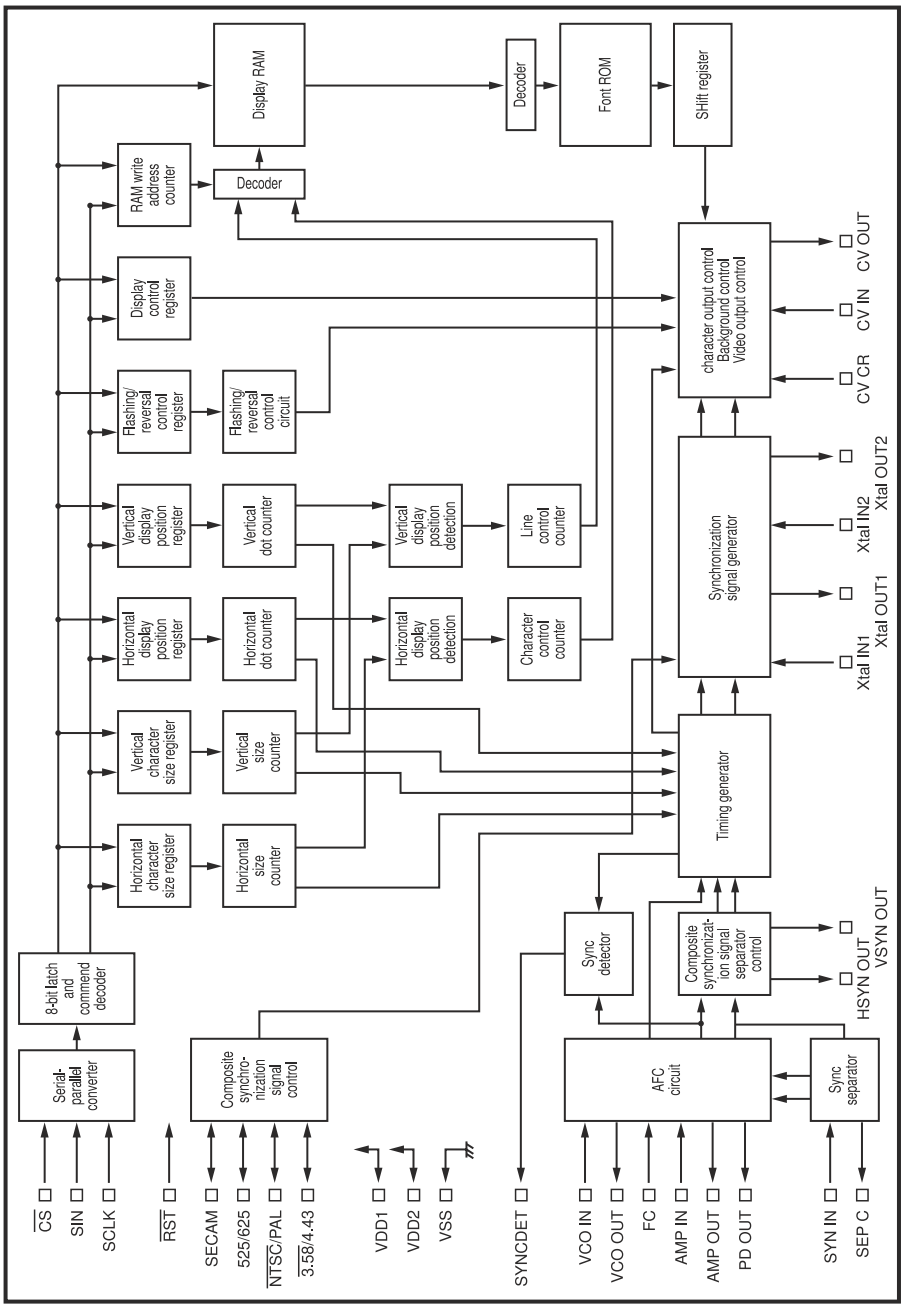
BA7660FS
COMPONENT VIDEO BOARD: U4301



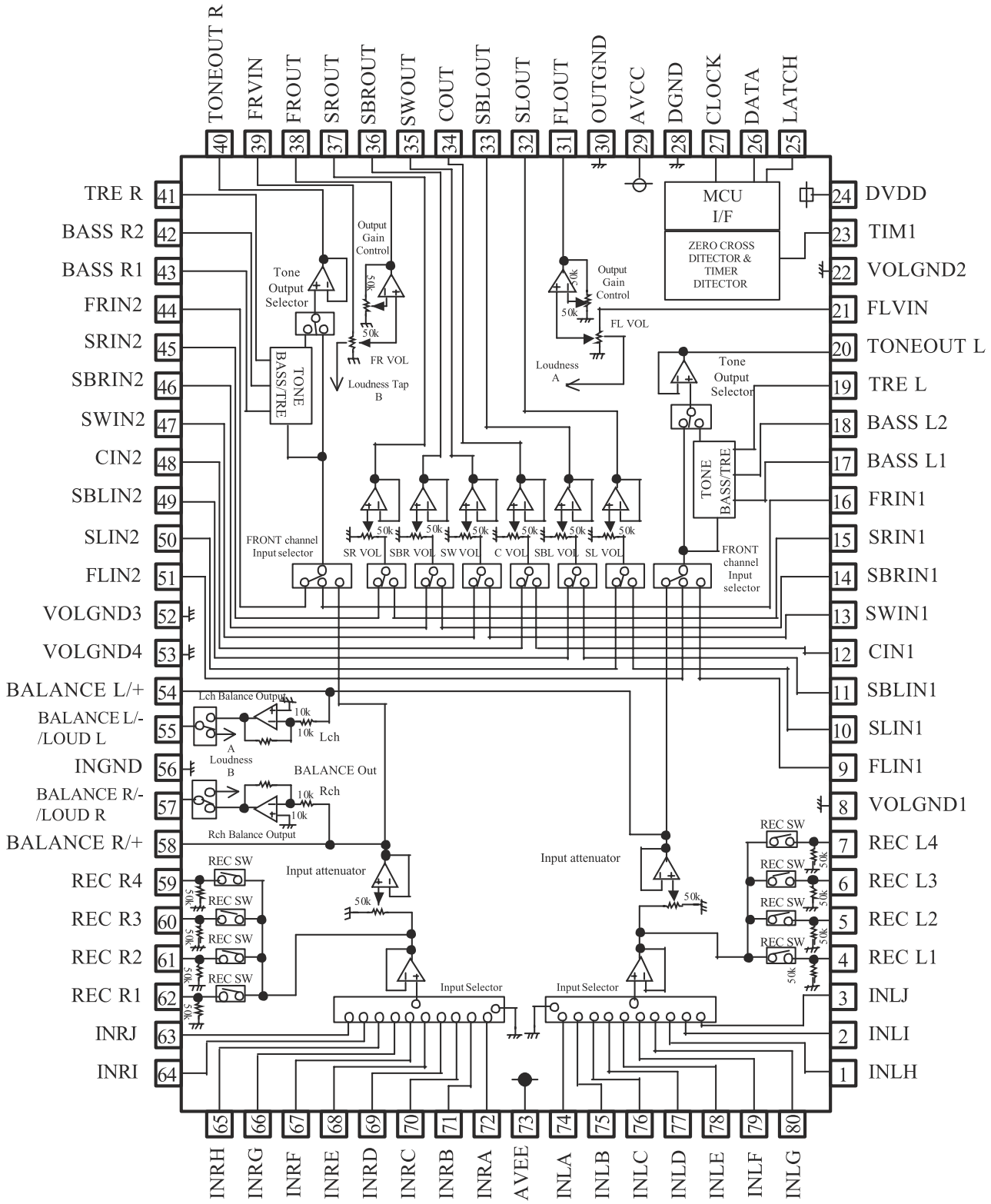
74HC4052
COMPONENT VIDEO BOARD: U4302 & U4303



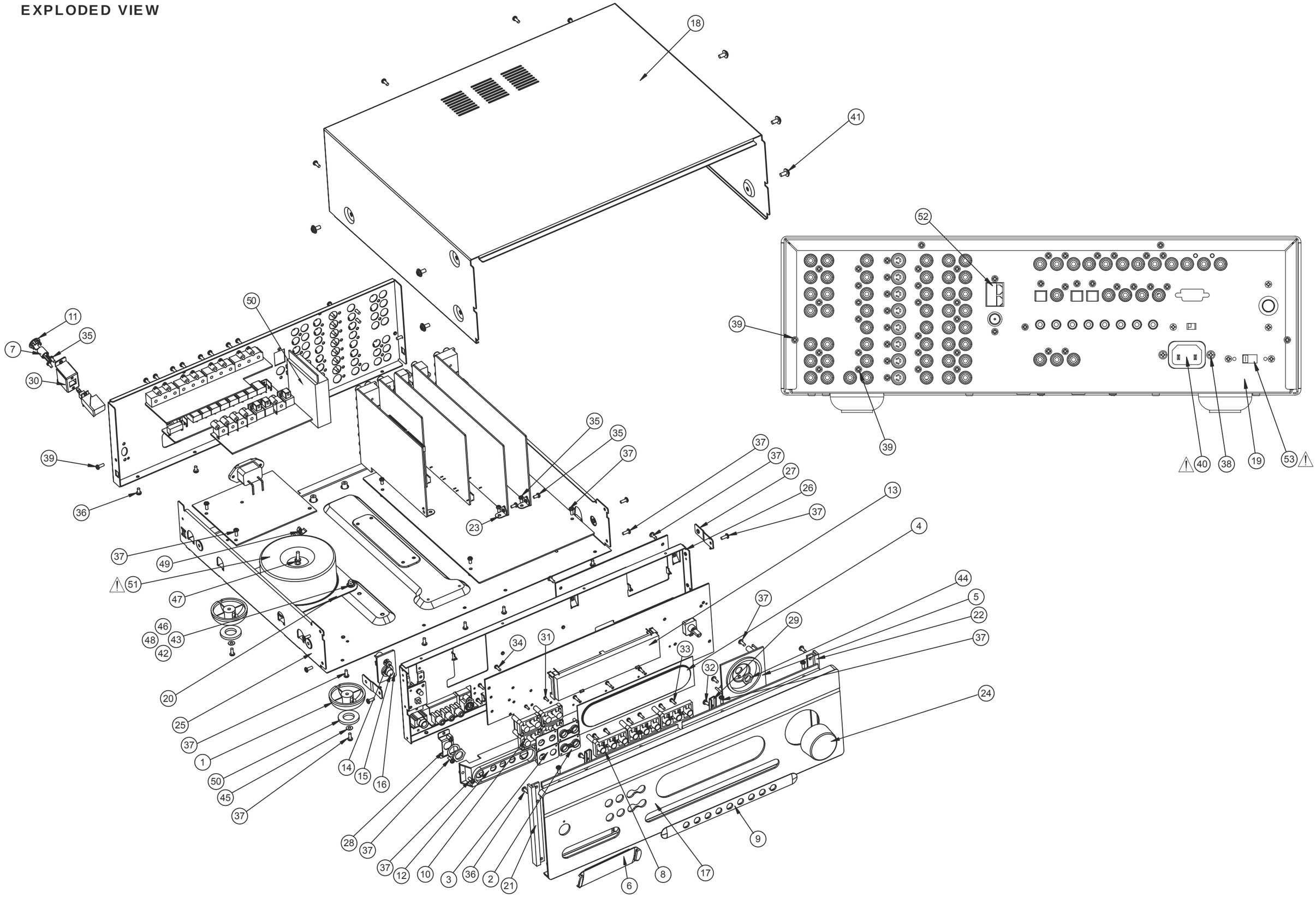
LC74763
S-VIDEO BOARD: U4101



M61516FP
MULTI-CHANNEL BOARD: U601 & U602



EXPLODED VIEW



EXPLODED VIEW PARTS LIST

Item	Part No.	Description	Qty.
1	10-0163017-01-00	PLASTIC FOOT DOME SHAPE	4
2	10-0163045-72-00	LINKED GOGGLE BEZEL	2
3	10-0163055-72-01	DUO GOGGLE BEZEL	2
4	10-0752001-00-10	WINDOW LENS	1
5	10-0752005-72-00	VOLUME BEZEL	1
6	10-0752007-72-00	VIDEO COVER	1
7	10-0752022-02-00	POWER BUTTON BLACK	1
8	10-0752032-72-01	INPUT BUTTON	3
9	10-0752035-71-00	INPUT BUTTON LOZENGE	1
10	10-0752042-72-01	DUO BUTTON	4
11	10-0752045-01-00	POWER BUTTON BEZEL	1
12	10-0752065-01-00	VIDEO HOUSING	1
14	10-0772011-00-00	LED LENS ROUND	1
15	10-0772022-72-01	POWER BUTTON TACT ACTIVATE	1
16	10-0772045-72-01	POWER BUTTON BEZEL	1
17	11-0163000-95-10	FASCIA	1
18	11-0163003-94-13	TOP COVER	1
19	11-0163006-94-10	REAR PANEL	1
20	11-0163015-00-00	TRANSFORMER BRACKET	1
21	11-0163028-95-00	SIDE CAP L	1
22	11-0163038-95-00	SIDE CAP R	1
23	11-0570075-80-01	L BRACKET	3
24	11-0752002-72-00	VOLUME KNOB ASSY	1
25	11-0752004-80-05	BOTTOM CHASSIS	1
26	11-0752025-80-04	SUBFASCIA	1
27	11-0752055-80-00	SIDE MOUNTING BRACKET	2
28	11-0752065-80-00	PHONE BRACKET	1
29	11-0752075-80-00	DUMMY BRACKET	2
30	11-0772065-80-00	POWER BUTTON BRACKET	1
31	13-0200502-22-00	SELF TAP SCREW 2 X 5 TYPE ìBî NI PLT	8
32	13-0260500-02-00	SELF TAP SCREW 2.6 X 5 P/H TYPE ìAî NI PLT	2
33	13-0260600-02-00	SELF TAP SCREW 2.6 X 6 P/H TYPE ìAî NI PLT	6
34	13-0260803-02-00	SELF TAP SCREW 2.6 X 8 B/H TYPE ìAî NI PLT	14
35	14-0300600-02-00	MACHINE SCREW M3 X 6 P/H NI PLT	10
36	14-0300600-52-00	SELF TAP SCREW 3 X 6 P/H NI-PLT TYPE ìBî	6
37	14-0300800-53-00	SELF TAP SCREW 3 X 8 B/B ZINC PLATED	22
38	14-0300803-04-00	MACHINE SCREW M3 X 8 B/H BLACK	4
39	14-0300803-54-00	TAPTITE SCREW 3 X 8 B/H TYPE ìBî BLK PLT	56
40 ⚠	34-0100002-00-70	AC INLET IEC 2 PIN 10A 250V	1
41	14-0400802-04-00	MACHINE SCREW M4 X 8 WASHER HEAD BLK	6
42	14-0501205-02-02	HEX HEAD SCREW M5 X 12 NI PLT	4
43	15-0500340-08-20	NUT M5X3.4 NI PLT	4
44	15-0900220-11-30	NUT ZINC PLATED M9.0 X 2.2mm 11p	1
45	16-0350080-04-35	STEEL WASHER I/D 3.5 X O/D 8.0 X 0.4 ZINC	4
46	16-0520080-12-30	SPRING WASHER I/D 5.2 X O/D 8 X 1.2 ZINC	4
47	16-0561200-10-20	STEEL WASHER I/D 5.6 X O/D 12 X 1 NI	8
48	16-0651050-02-99	SPRING WASHER I/D 6.5 X O/D10.5 X 2.0	1
49	17-0500960-00-01	PCB SUPPORTER CS-0610	3
50	17-1402603-30-22	RUBBER FOOT I/D14 X O/D26 X 3 PORON HH-48C	4

Item	Part No.	Description	Qty.
51 ⚠	25-0090060-30-20	XFORMER PW TOROIDAL 117V/234V TT-0332006-24	1
52	29-4000004-00-38	AM/FM TUNER MODULE KST-MB114MA0-23 (AH)	1
	29-4000002-00-38	AM/FM TUNER MODULE KST-MB114MA1-23 (C)	
53 ⚠	35-0132210-00-78	VOLTAGE SELECT OR 2P2T 10A CUL/VDE EV -32	1

ELECTRICAL PARTS LIST

Reference No.	Part No.	Description
AUDIO BOARD		
PCB ASSEMBLY	80-0901630-11-00	AUDIO ASSEMBLY
CAPACITORS		
C317-C319,C320-C332	22-3100022-00-43	CAP ELEC SS 10uF 16V 20% 85C
RESISTORS		
J3101,J3102	44-0000027-11-00	RES SMD 0 OHM 5% 1/10W 0805
RCA JACKS		
M301,M302	34-4060420-00-60	RCA JACK 6 R-R-R/W-W-W PCB MOUNT
M303	34-4040420-00-60	RCA JACK 4 R-R/W-W PCB MOUNT
COMPONENT VIDEO BOARD		
PCB ASSEMBLY	80-0901630-42-00	COMPONENT VIDEO ASSEMBLY
CAPACITORS		
C4301-C4309	22-3226052-00-43	CAP ELEC SS 2.2uF 50V 20% 85C
C4310-C4312,C4325	22-3100022-00-43	CAP ELEC SS 10uF 16V 20% 85C
C4313-C4315	22-3106052-00-43	CAP ELEC SS 1uF 50V 20% 85C
C4316,C4318,C4320	22-3101022-00-43	CAP ELEC SS 100uF 16V 20% 85C
C4317,C4319,C4321	22-3220022-00-43	CAP ELEC GS 22uF 16V 20% 85C
DIDOES		
JMP10,JMP24	20-0000000-00-13	DIODE SW 4NS DO35 1N4148
RESISTORS		
J4301-J4303	44-0000027-11-00	RES SMD 0 OHM 5% 1/10W 0805
RCA JACKS		
M431-M434	34-4032020-00-60	RCA 3 G-BL-R PCB MOUNT
ICs		
U4301	27-5176600-18-23	I.C. VIDEO 3-CH75 OHM DRIVER BA7660FS
U4302,U4303	27-0140520-18-00	I.C. SINGLE DUAL TRIPLE M74HC4052MIR
DIGITAL BOARD		
PCB ASSEMBLY	80-0901630-47-00	DIGITAL ASSEMBLY
CAPACITORS		
C905	22-3100022-00-43	CAP ELEC SS 10uF 16V 20% 85C
C1222,C1223	22-3101022-00-43	CAP ELEC SS 100uF 16V 20% 85C
C901,C902,C903,C904	22-3106052-00-43	CAP ELEC SS 1uF 50V 20% 85C
C1213,C1214,C1221	22-3226052-00-43	CAP ELEC SS 2.2uF 50V 20% 85C

Reference No.	Part No.	Description
FIBRE OPTICAL		
J1008	26-6691386-00-16	FIBRE OPTIC TRANSMITTER GP1FA550TZ
J1005,J1006	26-6701380-01-16	FIBRE OPTIC RECEIVING UNIT GP1FA550RZ
RCA JACKS		
J1001-J1004,J1007	34-4010320-00-60	RCA JACK 1 BLACK PCB MOUNT
ICs		
U1203	27-0125190-18-00	I.C. 8-CH MULTIPLEXER-SSOP 74HC251M1R
U901	27-0723200-18-43	I.C. DUAL RS-232 TRANSMITTER DS232AR
U1201,U1202	27-0804990-18-00	I.C. HEX INVERTER M74HCU04MIR
DSP BOARD		
PCB ASSEMBLY	80-0901630-65-00	DSP ASSEMBLY
CAPACITORS		
C1079,C1171,C1172	22-3100022-00-43	CAP ELEC SS 10uF 16V 20% 85C
C1137,C1138,C1143,C1144	22-3100052-00-43	CAP ELEC SS 10uF 50V 20% 85C
C1012,C1072,C1117	22-3101022-00-43	CAP ELEC SS 100uF 16V 20% 85C
C1119,C1133,C1182	22-3102022-00-28	CAP ELEC GR 1000uF 16V 20% 85C
C1004,C1014,C1016,C1062,C1083, C1096,C1100,C1155,C1173,C1174	22-3106052-00-43	CAP ELEC SS 1uF 50V 20% 85C
C1005	22-3226052-00-43	CAP ELEC SS 2.2uF 50V 20% 85C
C1020,C1021,C1030,C1031,C1040, C1041,C1050,C1051,C1091,C1094	22-3336052-00-43	CAP ELEC SS 3.3uF 50V 20% 85C
C1001,C1109-C1112	22-3470022-00-43	CAP ELEC SS 47uF 16V 20% 85C
C1060,C1073	22-3471012-00-28	CAP ELEC GR 470uF 10V 20% 85C
C1011	22-4210402-00-31	CAP MPF 0.1uF 63V 5% DMF 5 SERIES
C1092,C1152-C1154	22-4210502-00-31	CAP MPF 1uF 63V 5% DMF 5 SERIES
C1101-C1108	45-0101055-55-57	CAP CER SMD 100pF 50V 10% X7R 0603
C1132	45-0102055-55-57	CAP CER SMD 1nF 50V 10% X7R 0603
C1007,C1010,C1175,C1176	45-0103055-55-57	CAP CER SMD 10nF 50V 10% X7R 0603
C1002,C1003,C1008,C1009,C1013, C1015,C1017-C1019,C1061,C1074-C1076,C1078,C1081,C1082,C1090, C1093,C1095,C1099,C1124-C1128, C1150,C1151,C1177,C1178	45-0104056-57-57	CAP CER SMD 0.1uF 50V 20% Y5V 0603
C1006,C1121	45-0221055-55-57	CAP CER SMD 220pF 50V 10% X7R 0603
C1022,C1026,C1032,C1036,C1042, C1046,C1052,C1056,C1134-C1136	45-0222055-55-57	CAP CER SMD 2.2nF 50V 10% X7R 0603
C1139,C1140,C1145,C1146	45-0272055-55-57	CAP CER SMD 2.7nF 50V 10% X7R 0603
C1025,C1029,C1035,C1039,C1045, C1049,C1055,C1059,C1114,C1130,C1131	45-0472055-55-57	CAP CER SMD 4.7nF 50V 10% X7R 0603

Reference No.	Part No.	Description
C1141,C1142,C1147,C1148,C1024, C1028,C1034,C1038,C1044,C1048, C1054,C1058	45-0561055-55-57	CAP CER SMD 560pF 50V 10% X7R 0603
INDUCTORS		
L1001-L1008	24-0100127-00-28	IND CHOKE 10uH 10%
TRANSISTORS		
Q1001-Q1003	21-0000010-00-46	XTR SS NPN HEF 100 200MHz TO-92 C1815Y
RESISTORS		
R1001,R1002,R1079,R1083,R1223, R1225,R1227,R1229	44-0470120-51-00	RES SMD 4.7K OHM 5% 1/16W 0603
R1003-R1006	44-0330120-51-00	RES SMD 3.3K OHM 5% 1/16W 0603
R1007,R1191-R1194	44-0330920-51-00	RES SMD 33 OHM 5% 1/16W 0603
R1008,R1020-R1022,R1026,R1036, R1040,R1050,R1054,R1064,R1068, R1114,R1131-R1138,R1230	44-0100220-51-00	RES SMD 10K OHM 5% 1/16W 0603
R1009	44-0200320-51-00	RES SMD 200K OHM 5% 1/16W 0603
R1013	44-0120120-51-00	RES SMD 1.2K OHM 5% 1/16W 0603
R1023,R1030,R1037,R1044,R1051, R1058,R1065,R1072,R1120,R1121, R1126,R1127,R1027,R1028,R1033, R1035,R1041,R1042,R1047,R1049, R1055,R1056,R1061,R1063,R1069, R1070,R1075,R1077	44-0150120-51-00	RES SMD 1.5K OHM 5% 1/16W 0603
R1024,R1031,R1038,R1045,R1052, R1059,R1066,R1073	44-0620020-51-00	RES SMD 620 OHM 5% 1/16W 0603
R1078,R1080,R1084	44-0220120-51-00	RES SMD 2.2K OHM 5% 1/16W 0603
R1081,R1090,R1091,R1222,R1224, R1226,R1228	44-0270110-51-00	RES SMD 2.7K OHM 1% 1/16W 0603
R1082	44-0180110-51-00	RES SMD 1.8K OHM 1% 1/16W 0603
R1092-R1094,R1112,R1113,R1115, R1181-R1184	44-0100020-51-00	RES SMD 100 OHM 5% 1/16W 0603
R1116,R1117,R1122,R1123	44-0562117-51-00	RES SMD 5.62K OHM 1% 1/10W 0603
R1118,R1119,R1124,R1125	44-0118117-51-00	RES SMD 1.18K OHM 1%1/10W 0603
R1130,R1173-R1176	44-0470220-51-00	RES SMD 47K OHM 5% 1/16W 0603
R1166	44-0100120-51-00	RES SMD 1K OHM 5% 1/16W 0603
R1177,R1178	44-0150020-51-00	RES SMD 150 OHM 5% 1/16W 0603
R1195-R1198	44-0200120-51-00	RES SMD 2K OHM 5% 1/16W 0603
R1213-R1216	44-0750920-51-00	RES SMD 75 OHM 5% 1/16W 0603
J1001,J1002,R1010,R1099,R1171, R1172,R1217,R1218	44-0000020-51-00	RES SMD 0 OHM 5% 1/16W 0603
ICs		
U1001	27-9493260-04-70	I.C. DD DTS & MPEG DECODER PLCC CS49326
U1002,U1003,U1014	27-0324590-24-00	I.C. OCTAL BIDIRECTIONAL TRANS CEIVER SMD 74LVC245ATTR
U1004	27-0115790-25-00	I.C. QUAD 2-INPUT SELECTOR SOIC 74HC157MIR
U1005	27-9841500-25-53	I.C. 96KHz DIGITAL AUDIO INTERFACE RECEIVER SMD CS8415A-CS

Reference No.	Part No.	Description
U1007	27-2325607-00-88	I.C. EEPROM 256 X 8 BYTE 70nS PDIL W27C02-70
U1008,U1009	27-0657490-18-00	I.C. OCTAL D-FLIP FLOPS 3-STAGE O/P SMD 74LVQ574M
U1010-U1013,U1023,U1028	27-7055320-18-14	I.C. AUDIO LOW NOISE OP-AMP SMD NJM5532M
U1015,U1020	27-3031710-06-00	I.C. REG 1A TO-220(T) LM317T
U1025	27-9439200-24-53	I.C. 24BIT 192KHz STEREO DAC TSSOP CS4392-KZ
U1026	27-9436000-24-53	I.C. 24BIT 192KHz 6 CH DAC CS4360KZ
U1027	27-9533300-24-53	I.C. 24BIT 96KHz STEREO A/D CS5333KZ
U1029	27-0540940-18-00	I.C. 8-STAGE SHIFT & STORE BUS REG ISTER HCF4094BM1
OSCILLATOR		
X1001	28-5122200-04-19	CRYSTAL OSCILLATOR 12.288MHz 50ppm
KEYBOARD		
PCB ASSEMBLY	80-0901630-02-00	KEYBOARD ASSEMBLY
CAPACITORS		
C208-C211	22-3470022-00-43	CAP ELEC SS 47uF 16V 20% 85C
C212	22-3102012-00-28	CAP ELEC GR 1000uF 10V 20% 85C
C214	22-3107052-00-43	CAP ELEC SS 0.1uF 50V 20% 85C
C223	22-1103150-17-39	CAP CER KK 10nF 50V 10%
C255	22-3106052-00-43	CAP ELEC SS 1uF 50V 20% 85C
C241,C242	45-0102055-55-57	CAP CER SMD 1nF 50V 10% X7R 0603
C201,C202,C213,C215-C222,C256	45-0104056-57-57	CAP CER SMD 0.1uF 50V 20% Y5V 0603
C251-C254	45-0330055-55-57	CAP CER SMD 33pF 50V 10% X7R 0603
IR RECEIVER		
D201	26-0941380-00-00	IR RX 940nm 37.9KHz SHIELD
DIODES		
D212,D214-D218	20-0000000-00-13	DIODE SW 4NS DO35 1N4148
D220	20-3251902-00-01	DIODE ZENER BZX55 5.1V 1/2W 5%
ENCODER		
M201	35-6001219-00-08	ENCODER ROTATRY L=20mm VER W/O CLICK
TRANSISTORS		
Q201	21-0100100-00-46	XTR SS PNP HFE 100 200MHz TO-92 A1015Y
Q203-Q206	21-0000010-00-46	XTR SS NPN HEF 100 200MHz TO-92 C1815Y

Reference No.	Part No.	Description
RESISTORS		
R201-R207,R213,R219,R223,R224, R226,R227,R229,R231,R232	44-0100220-51-00	RES SMD 10K OHM 5% 1/16W 0603
R216,R225,R234	44-0100120-51-00	RES SMD 1K OHM 5% 1/16W 0603
R217,R218	44-0150120-51-00	RES SMD 1.5K OHM 5% 1/16W 0603
R220,R254-R269	44-0470120-51-00	RES SMD 4.7K OHM 5% 1/16W 0603
R221,R230	44-0220120-51-00	RES SMD 2.2K OHM 5% 1/16W 0603
R222	44-0220020-51-00	RES SMD 220 OHM 5% 1/16W 0603
R233	44-0470220-51-00	RES SMD 47K OHM 5% 1/16W 0603
R238	44-0120220-51-00	RES SMD 12K OHM 5% 1/16W 0603
R241,R242	44-0100020-51-00	RES SMD 100 OHM 5% 1/16W 0603
R251,R252	44-0100520-51-00	RES SMD 10M OHM 5% 1/16W 0603
R253,R270	44-0000020-51-00	RES SMD 0 OHM 5% 1/16W 0603
TACT SWITCHES		
S201-S217	35-1001117-00-67	SW TACT NO 1P1T 50mA/12V
ICs		
U201,U202	27-1086401-04-25	I.C. MCU 8 BIT 64KROM 1024 BYTE SCRAM PLCC T89C51RD2-SL
U203	27-9630600-14-62	I.C. VFD DRIVER SMD QFP PT6306
U204-U207,U211	27-0540940-18-00	I.C. 8-STAGE SHIFT & STORE BUS REG ISTER HCF4094BM1
U208	27-0140510-18-00	I.C. SINGLE 8 CH ANALOG MUX/DEMUX SMD M74HC4051MIR
U209	27-0324591-18-00	I.C. OCTAL BUS TRANSCEIVER 74VHC245M
U210	27-2300225-00-25	I.C. EEPROM 2K BYTE 250nS AT24C16
U214	27-9810000-28-36	I.C. MICROCONTROLLER RESET MONITORS TCM810LENB713
VFD		
VD201	41-4340100-00-13	VFD 16-BT-93GNK
CRYSTALS		
X201,X202	28-5200200-06-19	CRYSTAL 20.000MHz 30ppm HC-49S
LED BOARD		
PCB ASSEMBLY	80-0901630-32-00	LED ASSEMBLY
LED		
D211	26-0012587-01-10	LED RED-GREEN L-59SRKSGW-CA COMMON ANODE
TACT SWITCH		
S220	35-1001117-00-67	SW TACT NO 1P1T 50mA/12V
MAIN BOARD		
PCB ASSEMBLY	80-0901630-00-00	MAIN ASSEMBLY

Reference No.	Part No.	Description
CAPACITORS		
C701,C705,C706,C716,C725	22-3102032-30-28	CAP ELEC KM 1000uF 25V 20% 105C
C702,C719,C723	22-3101022-30-13	CAP ELEC KM 100uF 16V 20% 105C
C704	22-3472042-30-35	CAP ELEC 4700uF 35V 105C
C707	22-3222042-30-49	CAP ELEC KM 2200uF 35V 20% 105C
C710	22-3470052-00-43	CAP ELEC SS 47uF 50V 20% 85C
C711-C713	22-3102052-30-28	CAP ELEC KM 1000uF 50V 20% 105C
C715	22-4210502-00-31	CAP MPF 1uF 63V 5% DMF 5 SERIES
C721,C724	22-3222032-30-28	CAP ELEC KM 2200uF 25V 20% 105C
C727-C731	22-4210402-00-31	CAP MPF 0.1uF 63V 5% DMF 5 SERIES
C732,C733	22-3100022-00-43	CAP ELEC SS 10uF 16V 20% 85C
C734,C735	22-3470022-00-43	CAP ELEC SS 47uF 16V 20% 85C
DIODES		
D701-D710	20-1001401-20-44	DIODE RECT 1A/400V DO41 1N4004
D711	20-3203102-00-01	DIODE ZENER BZX55 30V 1/2W 5%
D715	20-5004700-50-02	DIODE BRI 4A/70V RS402L
D719	20-0000000-00-13	DIODE SW 4NS DO35 1N4148
RCA JACK		
M303	34-4030800-00-60	RCA JACK 3 Y-R-W PCB MOUNT
TRANSISTORS		
Q701	21-1011210-50-12	XTR PW PNP 1A/100V TO-126 2SD600KE
Q702,Q703	21-0000360-00-00	XTR SS NPN HFE200-700 30MHz 2SC2878A
Q704	21-0100390-70-14	XTR SS PNP HFE 30 250MHz SPT DTA 114ESA
Q705	21-0000400-70-14	XTR SS NPN HFE30 250MHz SPT DTC114ESA
RESISTORS		
R703-R705 ⚠	23-5228330-00-00	RES FUSIBLE 0.22 OHM 10% 1/2W
R706,R707	23-2228232-00-00	RES MO 0.22 OHM 5% 1/2W
J3103	44-0000027-11-00	RES SMD 0 OHM 5% 1/10W 0805
ICs		
U701,U704-U706	27-3000501-17-14	I.C. VOLT REG 5V 1A TO-220 NJM7805FA
U702,U707	27-3001201-17-14	I.C. VOLT REG 12V 1A TO-220 NJM7812
U703	27-3101201-13-14	I.C. VOLT REG TO-220F NJM7912
U708	27-9455800-21-14	I.C. OPERATIONAL AMPLIFIER DIP NJM4558
MULTI-CH BOARD		
PCB ASSEMBLY	80-0901630-64-00	MULTI-CHANNEL ASSEMBLY
CAPACITORS		
C607,C611,C612,C747-C754	22-3220022-00-43	CAP ELEC GS 22uF 16V 20% 85C

Reference No.	Part No.	Description
C626	22-3221022-00-43	CAP ELEC SS 220uF 16V 20% 85C
C627,C628,C633,C634	22-3101022-00-43	CAP ELEC SS 100uF 16V 20% 85C
C677,C678,C689,C690	22-3470022-00-43	CAP ELEC SS 47uF 16V 20% 85C
C755,C756,C775,C776	22-8226052-00-28	CAP ELEC 2.2uF 50V 20% NON-POLAR
C757,C758	22-4282302-00-31	CAP MPF 0.082uF 63V 5% DMF 5 SERIES
C759-C762,C769,C770,C773, C774,C777,C778,C789,C790	22-4210402-00-31	CAP MPF 0.1uF 63V 5% DMF 5 SERIES
C763,C764,C765,C766	22-4247302-00-31	CAP MPF 0.047uF 63V 5% DMF 5 SERIES
C767,C768,C771,C772	22-4233202-00-31	CAP MPF 0.0033uF 63V 5% DMF 5 SERIES
C779-C788,C791-C796	22-3100022-00-43	CAP ELEC SS 10uF 16V 20% 85C
DIODES		
D601	20-0000000-00-13	DIODE SW 4NS DO35 1N4148
D602,D604	20-3275902-00-01	DIODE ZENER BZX55 7.5V 1/2W 5%
INDUCTORS		
L601,L602	24-0101108-00-28	IND CHOKE 100uH 10%
RCA JACKS		
M601,M603	34-4060420-00-60	RCA JACK 6 R-R-R/W-W-W PCB MOUNT
M602	34-4020320-00-60	RCA JACK 2 B/B PCB MOUNT
RESISTORS		
P601-P603	44-0000027-11-00	RES SMD 0 OHM 5% 1/10W 0805
TRANSISTORS		
Q601	21-0000140-00-11	XTR SS NPN HFE 120 100MHz TO-92 SS8050C
Q602	21-0100131-00-11	XTR SS PNP HFE 170 1.5A TO-92 SS8550C
Q603	21-0100390-70-14	XTR SS PNP HFE 30 250MHz SPT DTA 114ESA
Q604	21-0000400-70-14	XTR SS NPN HFE30 250MHz SPT DTC114ESA
Q605,Q606	21-0000360-00-00	XTR SS NPN HFE200-700 30MHz 2SC2878A
Q607	21-0000450-70-14	XTR SS NPN 68 250MHz SPT DTA144ESA
Q608,Q609	21-0000120-70-14	XTR SS NPN HFE 68 30MHz SPT DTC144ES
ICs		
U601,U602	27-7661516-14-01	I.C. SOUND PROCESSOR 7.1CH VOL+TONE SMD QFP M61516FP
U603	27-9496600-21-02	I.C. QUAD BILATERAL SWITCH LC4966
U604-U607	27-7055320-18-14	I.C. AUDIO LOW NOISE OP-AMP SMD NJM5532M
PRE-OUT BOARD		
PCB ASSEMBLY	80-0901630-63-00	PRE-OUT ASSEMBLY

Reference No.	Part No.	Description
CAPACITORS		
C637,C642,C647,C652,C657, C662,C667,C672,C700,C705	22-3100022-00-43	CAP ELEC SS 10uF 16V 20% 85C
C640,C645,C650,C655,C660, C665,C670,C675,C703,C708	22-3220022-00-43	CAP ELEC GS 22uF 16V 20% 85C
C679,C680,C691,C692,C751, C752,C754,C756,C757,C759, C760,C762,C763,C765,C766, C768,C769,C771,C772,C774, C775,C777,C778,C780	22-3470022-00-43	CAP ELEC SS 47uF 16V 20% 85C
C753,C755,C758,C761,C764, C767,C770,C773,C776,C779	22-8226052-00-28	CAP ELEC 2.2uF 50V 20% NON-POLAR
C639,C644,C649,C654,C659, C664,C669,C674,C702,C707, C741-C746	45-0101055-55-57	CAP CER SMD 100pF 50V 10% X7R 0603
C721	45-0104056-57-57	CAP CER SMD 0.1uF 50V 20% Y5V 0603
C638,C641,C643,C646,C648, C651,C653,C656,C658,C661, C663,C666,C668,C671,C673, C676,C701,C704,C706,C709	45-0221055-55-57	CAP CER SMD 220pF 50V 10% X7R 0603
DIODES		
D611-D614	20-0000000-00-13	DIODE SW 4NS DO35 1N4148
INDUCTORS		
L602-L610	24-0100127-00-28	IND CHOKE 10uH 10%
RCA JACKS		
M607,M609,M610	34-4020400-00-60	RCA JACK 2 R-W PCB MOUNT
M608	34-4010300-01-60	RCA JACK 1 BLACK PCB MOUNT
M612	34-4020300-00-60	RCA JACK 2 B/B PCB MOUNT
TRANSISTORS		
Q608-Q615,Q617,Q629,Q630,Q632,Q633	21-0000350-70-00	XTR SS NPN HFE200-700 30MHz SPT RN1241A
Q616,Q618,Q620,Q622,Q624,Q631	21-0100390-70-14	XTR SS PNP HFE 30 250MHz SPT DTA 114ESA
Q641,Q644,Q645,Q648,Q649, Q652,Q653,Q656,Q657,Q660, Q661,Q664,Q665,Q668,Q669, Q672,Q673,Q676,Q677,Q680	21-0100410-00-12	XTR SS PNP HFE 280-560 110MHz 2SA1016KG-AA
Q642,Q643,Q646,Q647,Q650, Q651,Q654,Q655,Q658,Q659, Q662,Q663,Q666,Q667,Q670, Q671,Q674,Q675,Q678,Q679	21-0000410-00-12	XTR SS NPN HFE160-320 130MHz 2SC2362KF
RESISTORS		
R634,R638,R641,R645,R646, R650,R653,R657,R658,R662, R665,R669,R670,R674,R677, R681,R693,R697,R700,R704, R730,R740,R750,R760,R770, R780,R790,R800,R810,R820	44-0560220-51-00	RES SMD 56K OHM 5% 1/16W 0603
R635,R642,R647,R654,R659, R666,R678,R694,R701	44-0220110-51-00	RES SMD 2.2K OHM 1% 1/16W 0603

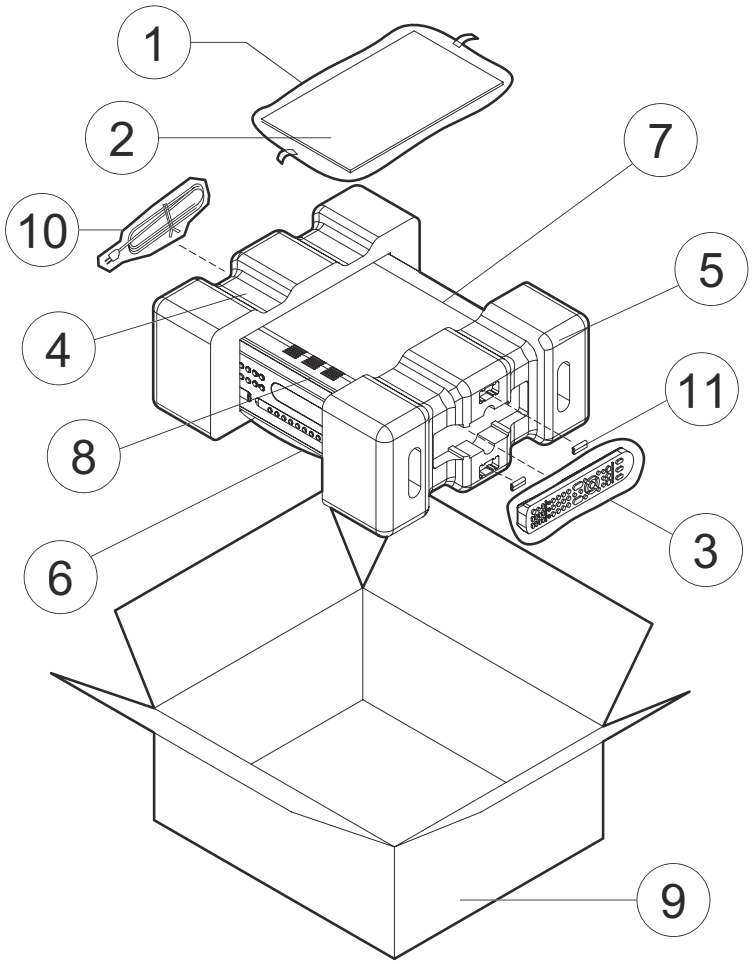
Reference No.		Part No.	Description
R636,R643,R648,R655,R660, R667,R672,R679,R695,R702		44-0330010-51-00	RES SMD 330 OHM 1% 1/16W 0603
R637,R644,R649,R656,R661, R668,R680,R696,R703,R729, R739,R749,R759,R769,R779, R789,R799,R809,R819		44-0100120-51-00	RES SMD 1K OHM 5% 1/16W 0603
R639,R651,R663,R682		44-0300020-51-00	RES SMD 300 OHM 5% 1/16W 0603
R640,R652,R664,R676,R683,R699		44-0100220-51-00	RES SMD 10K OHM 5% 1/16W 0603
R671		44-0560110-51-00	RES SMD 5.6K OHM 1% 1/16W 0603
R673		44-0430020-51-00	RES SMD 430 OHM 5% 1/16W 0603
R675,R698		44-0150020-51-00	RES SMD 150 OHM 5% 1/16W 0603
R714-R719		44-0220020-51-00	RES SMD 220 OHM 5% 1/16W 0603
R721,R724,R731,R734,R741, R744,R751,R754,R761,R764, R771,R774,R781,R784,R791, R794,R801,R804,R811,R814		44-0120220-51-00	RES SMD 12K OHM 5% 1/16W 0603
R722,R723,R732,R733,R742, R743,R752,R753,R762,R763, R772,R773,R782,R783,R792, R793,R802,R803,R812,R813		44-0470020-51-00	RES SMD 470 OHM 5% 1/16W 0603
R725,R726,R735,R736,R745, R746,R755,R756,R765,R766, R775,R776,R785,R786,R795, R796,R805,R806,R815,R816		44-0100920-51-00	RES SMD 10 OHM 5% 1/16W 0603
R727,R728,R737,R738,R747, R748,R757,R758,R767,R768, R777,R778,R787,R788,R797, R798,R807,R808,R817,R818,R824		44-0470920-51-00	RES SMD 47 OHM 5% 1/16W 0603
R825,R830,R835,R840,R845, R850,R855,R860,R865,R870		44-0000020-51-00	RES SMD 0 OHM 5% 1/16W 0603
ICs			
U609-U613		27-7055320-18-14	I.C. AUDIO LOW NOISE OP-AMP SMD NJM5532M
PSU BOARD			
PSU ASSEMBLY		80-0901630-01-00	PSU ASSEMBLY
CAPACITORS			
C752		22-3476052-00-00	CAP ELEC GS 4.7uF 50V 20% 85C
C753		22-4210202-00-31	CAP MPF 0.001uF 63V 5% DMF 5 SERIES
C754		22-3472032-00-28	CAP ELEC GR 4700uF 25V 20% 85C
C763	⚠	22-1103960-37-71	CAP CER 0.01uF 250VAC 20%
DIODES			
D751		20-0000000-00-13	DIODE SW 4NS DO35 1N4148
D752-D756		20-1001401-20-44	DIODE RECT 1A/400V DO41 1N4004
FUSESE			
F751	⚠	33-0151009-00-88	FUSE 500mA 250VAC TIME-LAG 5X20mm 5T UL/CSA/VDE/SEMKO
F752	⚠	33-0111009-00-88	FUSE 1A 250VAC TIME-LAG 5X20mm 5T UL/CSA/VDE/SEMKO
FH751,FH752	⚠	33-1000000-00-88	FUSE CLIP 0.05mm FC-53-11

Reference No.		Part No.	Description
CHOKE COIL			
L751		24-5400151-00-28	LINE CHOKE 400uH 1.5A 250VAC
RELAYS			
M751	⚠	32-1012100-01-97	RELAY MINIATURE 12VDC 10A 1P1T VDE
VOLTAGE SELECTOR			
M752		35-0132210-00-78	VOLTAGE SELECTOR 2P2T 10A CUL/VDE EV-32
TRANSISTOR			
Q751		21-0000010-00-46	XTR SS NPN HEF 100 200MHz TO-92 C1815Y
RESISTORS			
R751	⚠	23-5228330-00-00	RES FUSIBLE 0.22 OHM 10% 1/2W AXIAL
R754	⚠	23-8395232-00-06	COND PATH RESISTOR 3.9M OHM 1/2W 5%
STANDBY TRANSFORMER			
T751	⚠	25-0040021-31-18	XFOFMER PW EI-35 100V/220V T05382B
POWER SWITCH BOARD			
PCB ASSEMBLY		80-0901630-48-00	POWER SWITCH ASSEMBLY
CAPACITOR			
C764	⚠	22-1103960-37-71	CAP CER 0.01uF 250VAC 20%
POWER SWITCH			
S751	⚠	35-0101109-00-78	POWER SWITCH TV-8 10A/250VAC
S-VIDEO BOARD			
PCB ASSEMBLY		80-0901630-26-00	S-VIDEO ASSEMBLY
CAPACITORS			
C4101-C4107,C4109-C4111,C4113-C4115,C4117-C4120,C4153,C4157		22-3226052-00-43	CAP ELEC SS 2.2uF 50V 20% 85C
C4108,C4112,C4116,C4156		22-3471012-00-28	CAP ELEC GR 470uF 10V 20% 85C
C4123,C4124		22-3221012-00-43	CAP ELEC SS 220uF 10V 20% 85C
C4133,C4137,C4141		22-3106052-00-43	CAP ELEC SS 1uF 50V 20% 85C
C4134,C4145,C4149		22-3101012-00-43	CAP ELEC SS 100uF 10V 20% 85C
C4136,C4146		22-4247402-00-31	CAP MPF 0.47uF 63V 5% DMF 5 SERIES
C4138		22-7200210-00-09	CAP TRIMMER 20pF 20%
C4144		22-3477052-00-43	CAP ELEC SS 0.47uF 50 20% 85C
C4150		22-3470022-00-43	CAP ELEC SS 47uF 16V 20% 85C
C4151		22-3100022-00-43	CAP ELEC SS 10uF 16V 20% 85C
C4158		22-3101022-00-43	CAP ELEC SS 100uF 16V 20% 85C

Reference No.	Part No.	Description
DIODES		
D4101-D4107	20-0000000-00-13	DIODE SW 4NS DO35 1N4148
INDUCTORS		
L4101	24-0569107-00-28	IND CHOKE 5.6uH 10% AXIAL EC24-5R6K
L4102	24-0220107-00-28	IND CHOKE 22uH 10% AXIAL EC24-220K
DIN JACK		
M411-M418	34-4110300-00-60	DIN JACK 1 BLACK PCB MOUNT MD-113
TRANSISTORS		
Q4101,Q4103,Q4122,Q4131	21-0000120-70-14	XTR SS NPN HFE 68 30MHz SPT DTC144ES
Q4102	21-0000450-70-14	XTR SS NPN 68 250MHz SPT DTA144ESA
Q4107-Q4112,Q4116-Q4119	21-0100370-70-14	XTR SS PNP HFE 270-560 140MHz 2SA933AS
Q4113,Q4114,Q4121,Q4124,Q4125, Q4128,Q4130,Q4133	21-0000360-00-00	XTR SS NPN HFE200-700 30MHz 2SC2878A
Q4115,Q4126,Q4127	21-0000390-70-14	XTR SS NPN HFE270-560 180MHz 2SC1740S
Q4120,Q4123	21-0000380-70-14	XTR SS NPN HFE20 250MHz DTC-123ESA
Q4132	21-0000010-00-46	XTR SS NPN HEF 100 200MHz TO-92 C1815Y
ICs		
U4101	27-5574763-21-02	I.C. OSD DIP30SD LC74763-9012
U4102,U4103	27-5076250-21-23	I.C. AV SWITCH DIP BA7625
U4104	27-9496600-21-02	I.C. QUAD BILATERAL SWITCH LC4966
CRYSTALS		
X4101	28-5143200-06-19	CRYSTAL 14.318MHz 30ppm HC-49S
X4102	28-5177200-06-19	CRYSTAL 17.73447MHz 30ppm HC-49S
TRIGGER BOARD		
PCB ASSEMBLY	80-0901630-68-00	TRIGGER ASSEMBLY
DIODES		
D351,D352,D353,D358	20-3251902-00-01	DIODE ZENER BZX55 5.1V 1/2W 5%
D354-D357,D359-D363	20-0000000-00-13	DIODE SW 4NS DO35 1N4148
PHONE JACK		
M351-M357,M360	34-4310300-00-60	PHONE JACK 1 BLACK PCB MOUNT
TRANSISTOR		
Q351,Q352	21-0000380-70-14	XTR SS NPN HFE20 250MHz DTC-123ESA
RESISTORS		
R358,R359,R360	23-2121250-00-00	RES MO 120 OHM 5% 2W

Reference No.	Part No.	Description
SILDE SWITCH		
S351	35-4102209-00-67	SW SLIDE 2P2T RIGHT L=9
REGULATORS		
U352	27-3001201-07-85	I.C. VOLT REG 12V 0.1A TO-92 LM78L12
U353,U354	27-3001201-17-14	I.C. VOLT REG 12V 1A TO-220 NJM7812
VIDEO-6 BOARD		
PCB ASSEMBLY	80-0901630-45-00	VIDEO-6 BOARD
CAPACITORS		
C4401,C4402,C4403	22-3226052-00-43	CAP ELEC SS 2.2uF 50V 20% 85C
JACKS		
M4401	34-4010000-01-60	RCA JACK 1 YELLOW PCB MOUNT
M4404	34-4010100-01-60	RCA JACK 1 RED PCB MOUT
M4403	34-4010200-01-60	RCA 1 WHITE PCB MOUNT
M4402	34-4110300-00-60	DIN JACK 1 BLACK PCB MOUNT
J4401	34-4510302-01-80	PHONE JACK D6.3 1 PCB MOUNT
COMPOSITE VIDEO BOARD		
PCB ASSEMBLY	80-0907430-66-00	COMPOSITE VIDEO ASSEMBLY
CAPACITORS		
C4201,C4202,C4203,C4205,C4207, C4209,C4210,C4216,C4217	22-3226052-00-43	CAP ELEC SS 2.2uF 50V 20% 85C
C4204,C4206,C4208,C4211,C4218	22-3471012-00-28	CAP ELEC GR 470uF 10V 20% 85C
RESISTORS		
J4201,J4202	44-0000027-11-00	RES SMD 0 OHM 5% 1/10W 0805
RCA JACKS		
M421,M422	34-4040020-00-60	RCA JACK 4 Y-Y/Y-Y PCB MOUNT
TRANSISTORS		
Q4201-Q4203,Q4207,Q4208	21-0100370-70-14	XTR SS PNP HFE 270-560 140MHz 2SA933AS
Q4204,Q4206	21-0000120-70-14	XTR SS NPN HFE 68 30MHz SPT DTC144ES
Q4205	21-0000450-70-14	XTR SS NPN 68 250MHz SPT DTA144ESA
ICs		
U4201	27-9496600-21-02	I.C. QUAD BILATERAL SWITCH LC4966
U4202,U4203	27-5076250-21-23	I.C. AV SWITCH DIP BA7625

PACKING DIAGRAM & PARTS LIST



Item	Part No.	Description	Qty.
1	64-0200001-01-00	POLYBAG MANUAL	1
2	31-6407520-00-98	FM WIRE ANTENNA	1
	31-6472801-00-28	AM LOOP ANTENNA W/STAND	1
	34-0081004-00-67	300 TO 75 OHM ADAPTER	1
	34-0081006-00-80	ANTENNA ADAPTER "F" TYPE NICKEL PLT VG-06	1
	61-0163004-40-99	OWNER'S MANUAL T163 GB/F/D/NL	1
	61-0163004-41-99	OWNER'S MANUAL T163 E/I/P/S	1
	83-0762000-00-04	REMOTE CONTROLLER NAD ZR-2	1
3	83-0752000-01-04	REMOTE CONTROLLER NAD HTR-2	1
4	63-0752001-00-02	POLYFOAM ENDCAP LEFT	1
5	63-0752002-00-04	POLYFOAM ENDCAP RIGHT	1
6	64-0700001-00-00	POLYBAG MAIN UNIT	1
7	65-0752070-00-99	A3 WHITE PAPER	1
8	64-0743000-00-00	PROTECTIVE COVER	1
9	67-0163000-10-99	MASTER CARTON BOX	1
10*AH ⚠	36-2061010-07-76	POWER CORD UL/CSA SPT-2 AWG18 L=2m	1
*C ⚠	36-2283110-07-96	POWER CORD EURO-PLUG 10A/250V	1
11	37-0020200-00-79	BATTERY AAA 1.5V ER03X	4

NOTE: THE COMPONENTS IDENTIFIED BY ⚠ MARK ARE CRITICAL FOR RISK OF FIRE AND ELECTRICAL SHOCK. REPLACE ONLY WITH PART NUMBER SPECIFIED.

<*AH > : USA, CANADIAN MODEL ONLY.

<*C > : EUROPEAN MODEL ONLY.

VERSION HISTORY

SERIAL NUMBER	SOFTWARE VER.	PCB ASSEMBLY VERSION
R38T16300001-R38T16300011	V1.23	ONLY DSP BOARD ISSUE 2, ALL OTHER ARE ISSUE 5
R38T16300012-R38T16300016	V1.24	ONLY DSP BOARD ISSUE 2, ALL OTHER ARE ISSUE 5
R38T16300201-R38T16300500	V1.25	ONLY DSP BOARD ISSUE 4, ALL OTHER ARE ISSUE 6
R3YT16300501-R3YT16301100	V1.26	ONLY DSP BOARD ISSUE 4, ALL OTHER ARE ISSUE 6
R3ZT16301101-R3XT16301300	V1.26	DSP BOARD ISSUE 5, MAIN/TRIGGER/PWR SWITCH ISSUE 7 , ALL OTHER ARE ISSUE 6
R42T16301301-R42T16301385	V1.26	ONLY DSP BOARD ISSUE 7, ALL OTHER ARE ISSUE 6

SERVICE MANUAL

T 163

AV Tuner Preamplifier

NAD ELECTRONICS LTD
LONDON